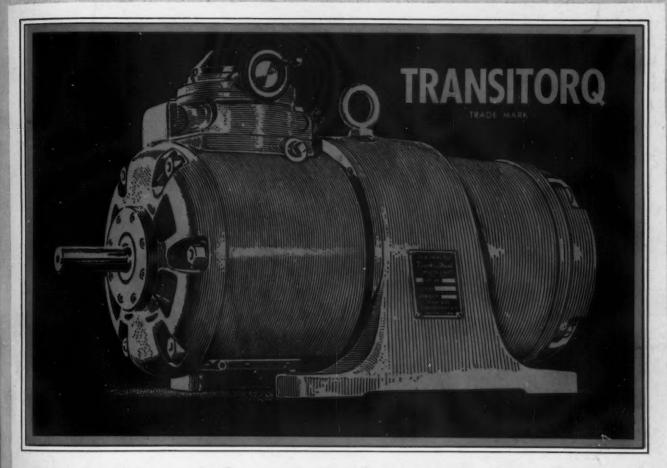
NOVEMBER 26, 1936



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Positive Drive Accurate Speed Control Preselection of Speed Any Type of Control

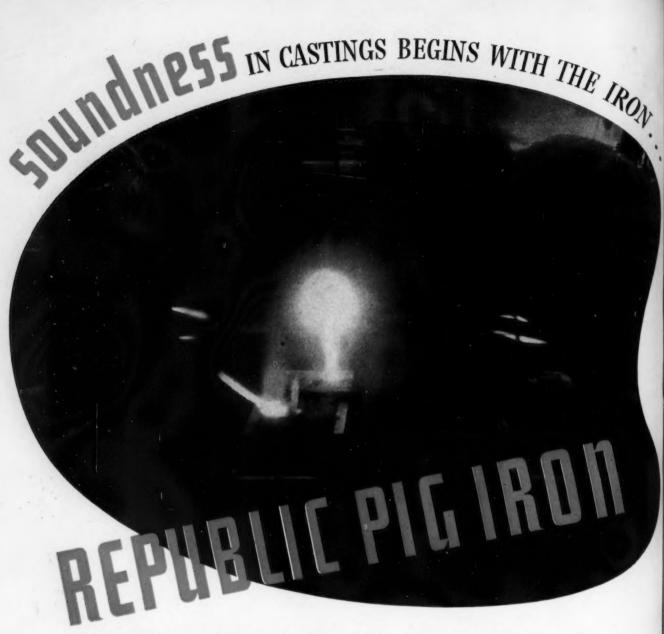


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2-THE IRON AGE, November 26, 1936

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RYERSON

24-THE IRON AGE, November 26, 1936

... THE IRON AGE ...

NOVEMBER 26, 1936

ESTABLISHED 1855

Vol. 138, No. 22

Just Too Sweet for Words . . .

E have expressed ourselves definitely, since election, as believing the best policy for business and industry is to adopt an attitude of conciliation and cooperation with the Administration—that we should do all that is humanly possible to help attain the main objectives expressed by the President, namely, a broader distribution of wealth, higher wages, friendly relations with labor and the reemployment of the idle and the relief workers in private industry.

That these thoughts reflected the conviction of a large part of our industry has been emphatically demonstrated by the unprecedented flood of increased wages that has swept over workers during the past two weeks. It would be hard to find a more effective example of willingness to broaden the distribution of wealth by sharing the returning fruits of prosperity with those whose daily labor helps so materially to produce it.

This notable gesture by industry should go far in assuring the Administration of the intent of management to "play ball" with labor and of management's expectation that both sides will get a fair deal from the umpire.

That expectation has been materially strengthened by what happened last week. Whether it was through design or circumstance makes no particular difference, but the important thing is that the chief anti-business pop bottle thrower has evacuated the bleachers.

That is the best news that industry and business has heard for years.

It means that the chief mental hazard which has hung over industry during the first term of the New Deal Administration has been removed.

Rexford Guy Tugwell, who went from Columbia University to Washington, has now gone into molasses. That is just too sweet for words!

Nine out of ten business men and industrialists will probably admit that the chief thing that estranged them from the New Deal was that Mr. Tugwell remained a prominent part of it.

You can hardly blame them for that. Any one in elevated position who would urge that "our best strategy is to surge forward with the workers and farmers of this country" to the end of discomforting business and industry and of abolishing it, if necessary, is not likely to encourage the good will and cooperation of the designated victims of "righteous wrath."

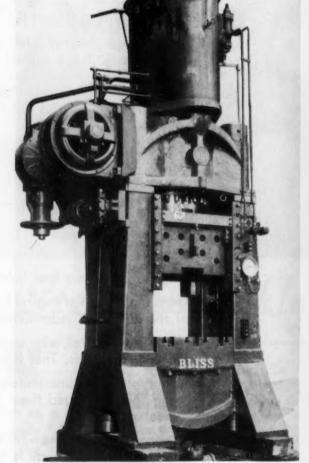
Well, Rexford G. Tugwell, in a chameleon shift has now become an "economic royalist" and vice-president of the molasses trust. In that capacity he can, if he pleases, urge the sugar cane growers and the molasses workers to surge forward and take over his job. But we do not think that he will. We believe that you have heard the last about Mr. Tugwell.

That in itself should be sufficient to give American industry a big forward impetus.

At Vaunementy



BLISS "hydro-dynamic" press of 1000 tons capacity, capable of from 7 to 10 cycles per min. under loads varying throughout its range and operating strokes up to 12 in.



By O. P. HATTON

Formerly Advertising Manager, E. W. Bliss Co.

0 0 0



IN the 100-year race between mechanically actuated and hydraulic presses in the pressed

metal industry there is about to appear a striking similarity to the classic "hare and tortoise" affair. Mechanical power presses made a flying start, according to available Patent Office records, in 1829. The hydraulic "tortoise" was probably abroad in the land, but the first official Patent Office date was scratched upon its shell in 1849—and that concerned merely the baling of some cotton.

The development of the mechanical "hare" has been described in a biography of the pressed metal industry (The Iron Age, Nov. 28,

Dec. 12 and 26, 1935). The varied industrial demands that successively brought pressure upon the designers of presses seem now to have smoothly merged into one great, swift flight toward the mass production of today. They ranged from the small metal parts of the glass lamps of early nineteenth century years and the shoe polish boxes that were nearly coincident, to the most modern all-steel auto body of today. The swing of the pendulum was far toward the side

of the mechanical and infinitely more speedy "hare."

The hydraulic "tortoise" was plodding meanwhile. There were always certain operations in which it majored and where its flexible application of power was supreme. For many years it reserved for itself the forming of large, heavy and deep-drawn sheet metal items—always at a slow and dignified pace that seemed to scorn the clamor for high production rates. But wartime pressure, with its prime requi-

site of the utmost speed, spurred the development and design of mechanical presses to the point of appropriating many even of these supposedly exclusive hydraulic functions.

The power press poached more and more upon the sphere of moderately deep drawn shapes. Auto and truck frame rails of heavy channel section were blanked and formed on huge power presses at 300 per hour—so far outstripping the hydraulic presses originally used as to put hydraulics to shame. Auto body parts and fenders, trac-

tor parts, tank ends and manhole covers, extrusion and even the forging of shrapnel and the forming of shell cases were among the preempted items. The makers and users of power machines were all for "bigger and better" power presses — and delivered and used them.

It is true the mechanical fraternity had some troubles. A very few thousandths variation in gage of material or a slight divergence from metallurgical specifications might breed a wastage or even breakage of dies or press that was

highly unpleasant. This made the very machines in the hydraulic camp grin, for their flexibility saved these troubles. But in the mechanical camp high production outweighed such minor worries and the power press engineers bestirred themselves to iron out their difficulties. To an extent they borrowed from hydraulic science by using hydraulic and pneumatic accessories. But their main reliance was upon more rigidly uniform stock and more suitable metallurgical characteristics. On the whole, the race has been all to the swift-footed development of the mechanical "hare" until almost the present

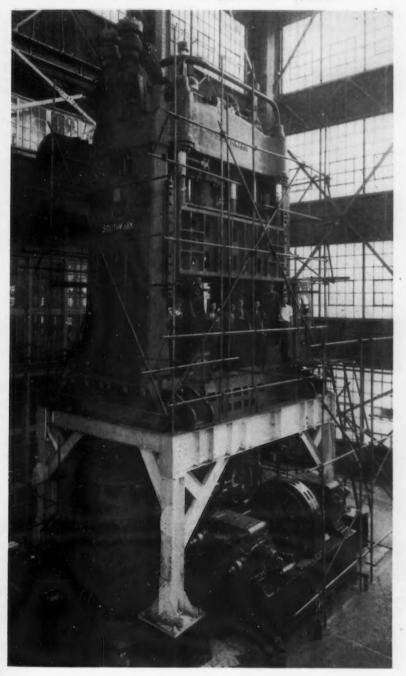
The hydraulic "tortoise," however, is hardly subject to censure since its pace was hampered to the greatest extent by the late and slow development of such necessary accessories as suitable pumps and control valves and devices. There has always been inherent in the hydraulic press certain advantages not existing in purely mechanical designs. Uniformity of speed, regardless of stock variation; variability of stroke and availability of any part of stroke for work purposes; reversibility of motion at will without completing the cycle of operation; the safety from breakage provided by the fact that the operation cycle ceases when a predetermined pressure has been applied without regard to position of ram; capacity for deep drawing; these always were the exclusive property of the hydraulic press.

The economic bar to mass production usage of hydraulic presses has been slow production rates and the cumbersome, expensive equipment required. These factors limited hydraulics in their scope and permitted the power press to absorb work where a high-speed, independently operated, self-contained machine was required.

The mere statement of these three qualities gives the vital reasons for past restrictions on usage of hydraulics. They were not rapid because devices for variable pressure and sensitive control were lacking. They were neither independently operated nor self-contained because the almost universal source of power was the accumulator with its constant pressure maze of piping, clumsy bulk and limitation of rapid changes in pressure.

High-speed, rotary, variable delivery pumps that could be directly

BALDWIN-SOUTHWARK CORP. 1000-ton, triple-action "Hyspeed" hydraulic press under erection and showing sub-structure apparatus.



connected to press cylinders, were developed to the point of practical application in this industry about 1922. They furnished one of the two factors necessary to put the hydraulic upon an even footing with the mechanical ("power") press. But this was at the peak of the period of development of highspeed, standardized mass production via the mechanical press and there was no special impetus toward the coupling of pump and press. Moreover, the other element required, the development of sensitive and positive control devices, lagged. The depression may be credited with at least one good mark for spurring designers of such equipment to provide it in an eminently satisfactory degree. Given these two factors, hydraulic

engineers have been very busy developing what is practically a brand new machine. It is one that joins hands with the mechanical type upon even terms as one of the two prime instruments of the pressed metal industry, that most versatile and highly productive of all mass production processes.

The hydraulic press has become self-contained. With the modern high-speed variable delivery pump, mounted overhead and directly connected, the bulky accumulator and piping are eliminated. It now requires no more floor space than a mechanical press of equal capacity. It has been speeded up by quick advance and return from the working portion of stroke. Since it was already capable of adjustment so that any portion of the total range

BELOW

lic press made by the E. W. Bliss

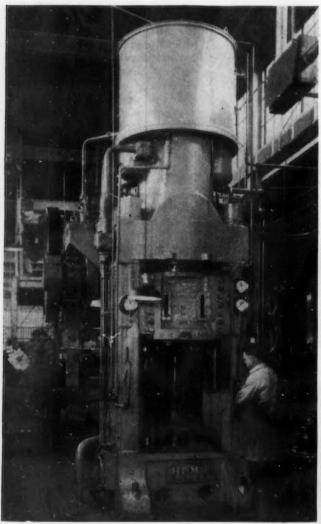
Co.

50-TON open

rod hydrau-

of stroke could be utilized as a complete operating cycle, it has been brought within the normal range of mechanical operation. Quickacting valves and electrical control make it extremely flexible. Pressure upon work and speed of the working stroke are uniform. With a wide range of pressure possible, the work-scope of the press is much broadened. Stop and reverse at any point in the cycle are at the instantaneous command of the operator and this provision permits the most delicate "inching" during the process of die setting. The more expensive types of dies are unnecessary because it is impossible to overload the press, and this permits profitable usage on shorter runs than hitherto.

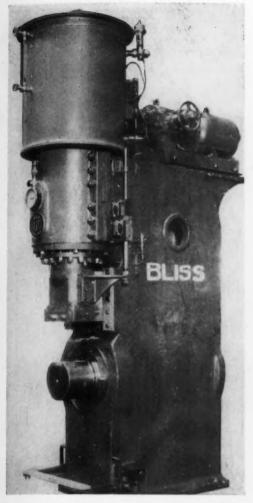
Thus has the "tortoise" came abreast of the "hare," and here we must permit the simile to rest, for neither type of machine is likely to wholly supersede the other. The extremely high-speed production of relatively small items will always be the function of the mechanical ("power") press. In the middle range of speed, size and depth of draw the two types will divide the field, the character of the work to be produced determining the choice upon nearly even terms. In the realm of heavy shapes and very deep draws the hydraulic will retain the supremacy it has always held.



HYDRAULIC PRESS MFG. CO.'s 750-ton hydro-power "Fastraverse" press deep drawing 13 gage sheets.

0 0 0

A 1500-TON "hyspeed" hydraulic press built by the Baldwin-Southwark Corp.



BLISS 300-ton hydraulic horn press, capable of 25 to 30 three-inch strokes per min.

Even at the expense of some recapitulation it is worth while to state briefly the outstanding features of the modern hydraulic press in addition to its recently acquired speed.

1. It can sustain pressure indefinitely, either on a fixed or yielding load, as on the hold-down slide on a double-acting press or in the manufacture of veneer and plywoods, embossing, plastics, extrusion, etc.

2. Ability to adjust stroke to suit variation in thickness of metal, eliminating imperfect work on thin stock or breakage on thick. Exertion of full pressure with appreciable dwell at the end of the stroke to "set" the work.

3. Uniform speed of ram movement. For a given pump and cylinder this is constant within +-5 per cent. Change in ram speed during stroke controlled by cutting in or out one or more pumps to the same cylinder or one or more cylinders to same pump. Further variations to a very sensitive degree by using both methods. The use of two sizes of pumps for change in speed is usual on smaller tonnage presses, while quick advance or "booster" cylinders are used on large presses—the main ram cutting in when work resistance is met.

4. Quick advance with lower uniform speed on work part of stroke is a great advantage in drawing,

eliminating shock of impact and irregularity of draw.

5. Straight line motion of pressure-transmitting element without side thrust upon adjustable ways.

 Safety against major breakage provided by safety and relief valves and accurate pressure control.

7. Flexibility when combined and synchronized with mechanical movements.

8. Versatility in the handling of a wide variety of jobs. Stroke variable from any desired minimum up to maximum and to be located at will between limits. Any such partial stroke controllable by stop and reverse as with full stroke.

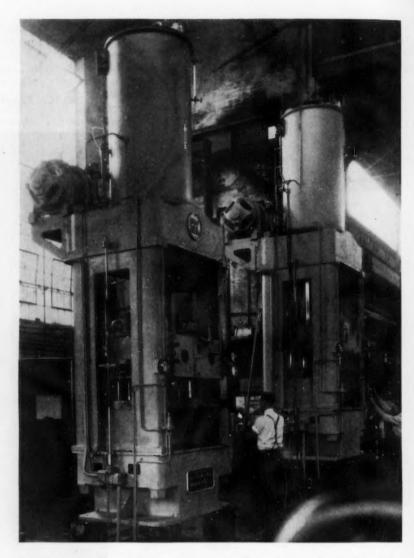
It is interesting to look briefly at

some of the factors that have made possible this epoch-marking advance in hydraulic engineering. The chief one is the direct connected, variable delivery rotary pump. Both volume and pressure can be varied at will and both are used in controlling the work-cycle. A clear conception of saving in space is furnished by comparison of dimensions between reciprocating and rotary types. The former in 600-hp. peak capacity requires a 14x20-ft. floor space, while the same capacity rotary needs only a 4-ft. cube. This is not to say that the reciprocating type is obsolete. Consideration of its usage, however, is not necessary in recording the revolutionary developments in press equipment.

The gear, balanced vane, double stage, and double gland types of rotary pumps are available in several designs capable of pressures up to 2000 lb. per sq. in. They are efficient and less expensive than pumps of the rotary piston type. All have fixed capacity at a given speed, regardless of pressure-except that slip, or decrease in discharge with increasing pressure is about double that of equivalent reciprocating pumps. Normal speeds range from 850 to 1150 r.p.m., though speeds up to 1700 r.p.m. are used in some cases. Fixed capacity rotary pumps are applied to presses the same as reciprocating pumps. Gear and vane types give capacities up to 60 gal. per min. at 200 lb. to 1000 lb. pressure. Those of 2000 lb. pressure have maximum capacities of 5 and 17 gal. per minute.

Rotary variable stroke piston pumps of the type used in our Navy for turret and gun control are the most accurate and sensitive pumps made. Pistons are arranged axially and stroke is changed by a variable angle swash plate. Power is transmitted by a universal joint. They are, however, very expensive and are not used in connection with presses.

Rotary variable delivery pumps with radial pistons and stroke varied and reversed by shifting the center of rotation of pistons with reference to the center of rotation of cylinders are capable today of pressures up to 3000 lb. per sq. in. Such pressures can be sustained when proper cooling and filtering devices are provided. Several designs are on the market, but all are fundamentally similar. This type can be used as fixed stroke pumps and applied to presses in the same



TWO double platen presses on the assembly floor of the Hydraulic Press Mfg. Co. In the bed is a third member for auxiliary forming or knock-out.

manner as the latter. They may be used with flow in one direction only and equipped with an automatic device for reducing stroke as pressure increases, thus economizing on horsepower demand. The flow-reversal feature permits simplification of valve equipment. Any automatic control device which can be applied to a valve can be used for pump stroke control. Rotary piston pump speeds vary from 1150 r.p.m. on the smaller sizes to 400 r.p.m. on the largest. They are generally designed to use standard motor speeds.

All types of rotary pumps eliminate the need for packing, use oil and depend upon close fit and high viscosity to keep slip to the minimum. Because the heavier grades of lubricating oils are used instead of water, no lubrication is required. In fact, there is practically no maintenance needed save that of

keeping the oil clean. Since valving is accomplished by the rotation of the pump itself past suction and discharge ports, there are no valves to grind. With reasonable care the life of such pumps should be ten to fifteen years. When wear does occur they may be restored to original efficiency by replacement of moving parts.

Several types of valves are employed to meet the varied demands of hydraulic usage. The lapped piston valve, completely balanced, is widely used, especially for oil. When used with water, the piston valve must be packed, and to avoid the wear of passing packing over ports, special designs have been developed with double ports. The packed type, however, is harder to operate than the lapped piston and in sizes 3 in. and up requires pilot operation. Some flat seat rotary disk valves are used, but only

where no pressure or only light pressure is involved. The usual type for water installation or accumulator service is a seated valve like those on a gasoline engine except that they are guided by wings instead of by a central shaft. A seat is required for each inlet and outlet and a double-action press thus requires four. To operate from one lever a system of cams is employed. To ease effort in operation they are usually at least partially balanced in large sizes by pistons attached to the stem. In extremely large sizes they may be pilot-operated. The rotary cock is not satisfactory under high pres-

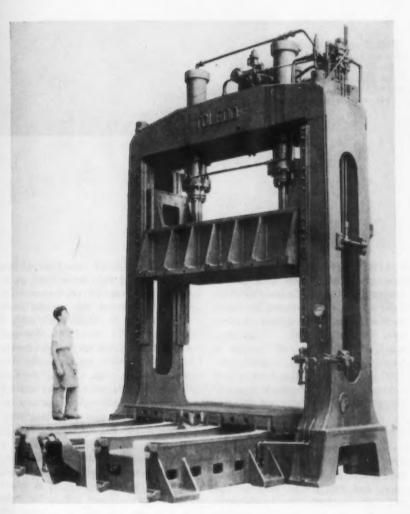
hydraulic type provides an aptly descriptive title, the so-called "power" press does not sufficiently distinguish its character. chanical" would be a more logical term, but the vested interest of nearly a century of preeminence in the pressed metal field will probably be hard to change. The second point in confliction is in the terms "single" and "double" action. In the hydraulic type "single" action means power applied in one direction only; "double" action where power is applied in both directions. Such classification has no relation to similar terms in "mechanical" presses.

weights or auxiliary down stroke cylinders. The down stroke type, of course, requires one of these return devices in all cases. The return or push- or pull-back cylinder is chiefly used for rapid action, since the counterweight is slow and the spring is limited to relatively short strokes. Another classification-"open rod" or "closed housing"-is descriptive of the frame construction. There are also the "C" frame, or "gap," and "horn" presses as in the mechanical equivalent. The operating position is chiefly vertical or horizontal, but the hydraulic press will operate in any position. Few, however, are inclined.

The modern hydraulic press may truly be said to mark a transition from the age of standardization in mass production to that of diversification-a phase to which the recent depression has contributed the motive force. It is destined to go far in answering the present need of the pressed metal jobbing shop. In the past, hundreds of inquiries came to the so-called "contract" stamping concerns for prices on the production of a very few thousand (often hundreds) of this or that item that could be made most advantageously (from the engineering point of view) in pressed metal. The preparatory cost in dies and in adjustment of the mechanical press was out of all proportion to the usable value of the article and to the press time occupied in production. Such items were either dropped entirely or went to the profit of other production methods. Today the shop equipped with the modern version of the hydraulic, aided by new and less costly methods of die production and its extreme versatility in operation, will be able to save a substantial proportion of these for its industry. Perhaps, in so doing, it will give the initial impetus to new devices that will, later, develop into profitable staples.

The "hare" and the "tortoise" are providing the pressed metal industry with an extremely facile equipment capable of both extremes of production—the short run on widely varied products, and the high-speed mass production of single articles. In both cases cost will be within economic limits, and the transference to hydraulic production of those types for which it is

(CONTINUED ON PAGE 104)



A 50-TON hydraulic die spotter built by the Toledo Machine & Tool Co.

sure and is rarely used except for intermittent operation.

Consideration of the modern hydraulic press in relation to the pressed metal industry involves some confusion of nomenclature. The first is the fact that, while the

Two major classifications of design present themselves—the up stroke and the down stroke. The former permits return by gravity, but this is necessarily slow, and rapidity or stripping action may be had by the use of springs, counter-



THE pressed steel bathtub, long the dream of manufacturers of pressed steel equipment

for the home, now has taken its place with kitchen cabinets and sinks, bathroom fixtures and various other procelain enameled products that appeal to the home owner because of design, attractive finish, lightness in weight and other qualities. Much credit for the creation of a very broad market for enameled pressed steel products is due to manufacturers who have so perfected their processes and manufacturing methods that this equipment can be sold at prices within the reach of nearly everybody.

With the renewed activity in home building the outlook for a large volume of sales in pressed steel bathtubs in the next year or two is regarded as very promising and the manufacture of these tubs promises to furnish steel makers a new outlet for considerable tonnage of sheet steel.

1,325,000 Tubs Sold in 1935

Since 1870, when bathtubs were first accepted in this country on an appreciable scale, the bathtub industry has grown from an infant which produced less than 100,000 units annually to a large industry whose sales in the peak year, 1935, totaled 1,325,000 tubs. In that comparatively short time the bathtub industry increased its use of cast iron from a meager 20,000 tons a year in the early part of the century to more than 265,000 tons in 1925.

Common as the bath now is in the average American home, there is still a large unfilled market for bathtubs and showers in the United States. A real property inventory taken in 1934 in 64 cities revealed, when results were applied to the whole country, that about 9,971,000 urban homes are equipped with tubs, but a different picture is presented on the farm. The 1930 farm census disclosed that only 531,248 farms, or 8.45 per cent, have water piped into bathrooms.

The latest estimate of the Stand-



THE Brigsteel Beautyware bath—complete with all the modern fittings and improvements known to plumbing supply manufacturers.

ard Sanitary Mfg. Co. indicates that about 15,000,000 tubs are in use in the United States, but this figure includes, of course, the large number outside of homes—in hotels, institutions, etc. The estimate of 15,000,000 tubs in use is based on sales of 18,900,000 from 1900 to 1925, inclusive, from which a deduction has been made to cover those exported, destroyed by fire or discarded because of obsolescence.

Not only does a large farm market exist for bathtubs, but also for other plumbing fixtures and pipe, but the urban market has not approached the saturation point. In the 64 cities covered by the 1934 survey more than 25 per cent of homes were without tubs or showers.

Pressed Steel Tubs are Making Headway

For many years bathtubs were made princially of cast iron, and at first no attempt was made to enamel them. Enameled tubs are said to have first been made in

1882. Within the past year or two pressed steel tubs have been gaining ground rapidly. A formed steel built-in recessed tub weighs from 110 to 125 lb., compared with a weight of 375 to 425 lb. for cast iron. One of the largest producers of sheet steel bathtubs is the Briggs Mfg. Co., Detroit, whose products have been on the market since 1932, although mass production did not begin until last year. A previous attempt was made in 1904 to draw a bathtub from a single sheet of steel by the Seamless Pressed Steel Bathtub Co., Detroit, which equipped a plant with a capacity of 100 to 150 tubs a day, but this company went out of business in the depression of

The next attempt to use sheets in place of cast iron was in 1928, when the Steel Sanitary Co. was formed in Alliance, Ohio, to manufacture from enameled and stainless sheet steel a full line of sanitary fixtures, including bathtubs. The company planned to turn out 1200 enameled and 400 stainless





fixtures daily. This enterprise was the result of the application of mass production methods to the utilization of sheet steel in the sanitary field by J. C. Cromwell, general manager. This organization believed that previous attempts to convert the sanitary field from iron to steel had failed because of small scale operations and uneconomical methods of manufacture, which made the costs higher than were those for cast iron ware. This organization is now operating under the name of the Alliance Porcelain Products Co.

The bathtub manufactured by the Alliance company is made in two pieces, each forming one end, and the two being flash welded together to form the complete tub. There is a third member, the apron, which covers the front of the tub. This also is a stamping and is welded to a flange at the top of the tub. The two members of the tub proper consist of the slanting end, which is about three-fourths of the length of the tub, and the drain end, which forms

the remaining one-fourth of the tub. In making a tub longer than the standard lengths the slanting end is lengthened, the end of the drain end always remaining the same.

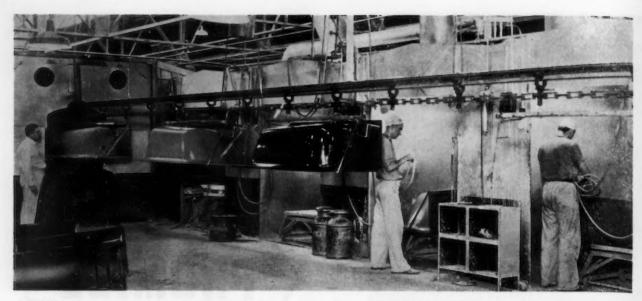
Made from 12-gage enameling sheets the tub in the standard size is 60 in. long, 30 in. wide and 18 in. deep. A 5-ft. recessed tub with its apron weighs 130 lb. For making a tub of this size 39½ sq. ft. of sheet steel is used, but this area is increased by drawing, the completed tub having 43 sq. ft. of surface.

Various economies in production have been effected in the manufacture of these tubs. One is in the shearing of the blanks so that there is a surprisingly small amount of scrap loss. Another is that a press of smaller capacity may be used than would be required in making a tub in one piece. Both the slanting end and the drain end are drawn in one press operation on the same press and the apron is made in one forming operation. Adjustable dies are

used in permitting the making of a tub of any length from 3 ft. to 6 ft. and in other than the standard widths and depths with one set of dies for each part.

The two ends of the tub and the apron are assembled by flash welding in resistance welding machines of 500 kva. capacity especially designed for this work. There are two of these machines, one for each operation. The work is set in fixtures and the edges are brought into contact by hydraulic pressure, which holds the two pieces in position for welding. Then the current is turned on and the weld is quickly made. The length of the transverse weld around the bell of the tub is 56 in. and the longitudinal weld joining the apron to the tub is 60 in. for the standard size tub, although this machine has a capacity for making a weld up to 72 in. long.

A narrow flange extends horizontally from the top of the tub and the apron is welded in a horizontal position. The welding operations are performed at a



VIEW in the enameling department where porcelain enamel is sprayed on bath tubs mounted on revolving pedestals in the booths. After spraying, the tubs are hung back on the conveyor which carries them through the drying oven at the left and from this oven they go to the burning furnaces. View in plant of Alliance Porcelain Products Co.

speed of 120 per hr. on each machine.

After welding, the flash at the weld is chipped and ground, producing a smooth, homogeneous surface for the application of the porcelain enamel. Then the tub goes to a press for notching, trimming and flanging and for bending over the apron to its vertical position at the front of the tub. The final fabricating operation is attaching braces to hold the apron in place, which is done on the portable electric welder. The tubs are then inspected and placed in storage, from which they are carried on a chain conveyor to the pickling department, where standard practices for cleaning work

before enameling are carried out in a series of tanks.

The porcelain enameling department is flexibly arranged in order that the same equipment may be used in enameling bathtubs, washing machine tubs and other enameled sanitary ware. The work is sprayed in five booths in which the tubs are set on revolving pedestals during spraying. A booth accommodates one bathtub or two washing machine tubs. After pickling, the tubs are hung on a second conveyor, which carries them through the enameling department for the successive operations. This conveyor passes in front of the spray booths and after spraying, the tubs are hung back on the

conveyor and pass through a drying oven, in which they travel 75 ft. and are dried at a temperature of 300 deg. From the drying oven the conveyor carries them to a point in front of the burning furnaces.

Burning is done in two box type V-bottom, natural gas fired furnaces equipped with automatic gas control and temperature recording instruments. Suspension of work of this size on a conveyor in a continuous burning furnace has not proved very satisfactory because of the danger of warpage For that reason the box type furnaces are used and the tubs are set on burning tools and are handled in and out of the furnaces on two charging forks. Each furnace has a capacity for four tubs.

The ground coat is applied to all surfaces of the tub, after which the interior and apron front are given two white cover coats, the usual drying and burning operations following the application of each coat of enamel. The ground coat is burned at 1600 deg. F., being kept in the furnace 7 min., and the cover coat is burned 5½ min. at 1550 deg.

After burning the second cover coat, tubs are hung back on the conveyor, on which they are inspected, and move on to the storage and shipping room. The plant has a capacity for turning out 130 completed tubs in an 8-hr. day, the output being restricted at present to that number by the limited



BROUGHT to England in the 18th century, this tub was carved from a solid block of statuary marble and was used by an Italian artistocrat.

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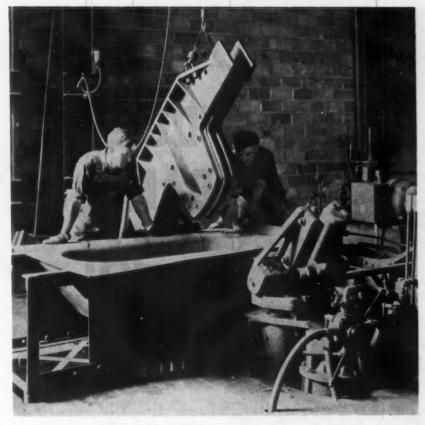
facilities of the enameling department as compared with the remainder of the plant. The stamping department has a capacity for producing 1000 tubs and 960 can be welded in 8 hours.

Mass Production of Steel Tubs by Briggs

The Briggs Mfg. Co. uses enameling iron for its metal ware, which is fabricated by presses capable of exerting a pressure of 1500 tons. By means of these a sheet of iron, 42 x 84 in., may be drawn into any desired shape. To prove that the new bathtubs possess more than adequate strength, the manufacturer once led an elephant into one of the regulation size tubs, where it stood for a moment without causing the tub to lose its shape. Another time, a 480-lb. weight was lowered into the tub 139,000 times, flexing the metal 23 times per min. The metal and porcelain flexed together under this strain and not a defect or a crack showed in either. This test was equal to the wear which would result from four persons taking a daily bath for 102 vears.

Only three coats of enamel are necessary on this metal, since a good enameling iron has a smooth, velvety and fine-grained surface. Immediately after application, each of the three coats is fused into the surface of the iron under high temperature, the final coat being an acid resisting enamel.

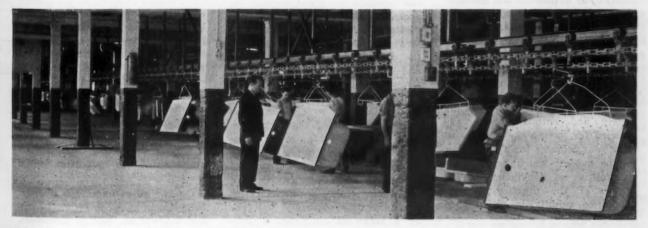
Because of the use of the wet process, which enables the ground coating to be applied to completely cover the entire fixture, thus making it rust-proof, white or colored enamels can be applied to formed



THE Alliance pressed steel porcelain enameled bath tub is made in two pieces which are flash welded together in a resistance welding machine built for this purpose, the welded joint, which is near the drain end of the tub being 56 in. long. This picture shows the tub in position for welding in the welding machine fixture in which the edges to be welded together are held in contact by hydraulic pressure.

products of almost any design with equally perfect results. Combinations of colors on each individual product, not possible on cast iron, are readily applied to the formed metal by the wet process. Colors or combinations of colors may thus be purchased to harmonize with the color scheme of bathrooms or kitchens.

It has been estimated that 300,-000 tons of sheets a year would be required if all bathroom and kitchen equipment, such as tubs, lavatories, toilets, sinks, etc., were eventually made of steel instead of cast iron, but this would not be a clear gain to the iron and steel industry, which supplies the raw material in either case.



LIKE the production line of a large automobile factory, an ingenious, overhead conveying system carries bath tubs, lavatories, kitchen sinks and other plumbing fixtures through the various processes of production in the plumbing ware plant of the Briggs Mfg. Co. in Detroit.



THE article which appeared in The Iron Age of Sept. 24, entitled "Reciprocity be Damned," seems to have struck a sympathetic chord in the metal-working industry. It has created extra work for our postman, judging by the number of comments that have been received. Perhaps our readers would be interested in the general tenor of them, so we present a fair sample. Most of the authors, for obvious reasons, wish to remain anonymous.

Opens the Door to Business Baiters

XPLETIVES more vituperative than "Reciprocity Be Damned," which was used by the anonymous author of the splendid short article on the subject in the current issue (Sept. 24, 1936) of THE IRON AGE, are being applied in an ever-increasing number of instances to the now widespread pernicious reciprocal buying and selling practice. You, as editor of THE IRON AGE, no doubt will be widely and enthusiastically applauded for having the courage to offer your columns for a discussion of the subject which has all the possibilities of convincing perpetrators of the practice that it should be voluntarily ended once and for all.

A large manufacturer of rubber goods early in this year indicated that it was in the market

for a large quantity of a certain article. Some of the companies receiving the inquiry deemed the quantity sufficient to warrant sending special representatives. These were told, in effect, "we are very sorry you went to the expense and trouble of making a call, for all we want is enough price information to enable us to check XY Company's quotation, because we have instructions from the top to give the business to XY Company on account of reciprocal arrangements." A few months later a large automobile firm came into the market for the same article and a company other than XY Company did all the original estimating and engineering only to be told later, as were other subsequent competitors, that the business would have to go to XY Company by reason of instructions received from the top on account of reciprocal arrangements. One of the recent largest purchases of this same item was made last year by a large oil company. Practically all of the manufacturers of the item competed for the business. It ended with the business going to this same XY Company and the others being told, in effect, by the purchasing department that such last minute instructions were received and based on reciprocal arrangements.

These are only a few instances occurring in connection with one industry in which the business in this line went to one and the same company on the basis of reciprocal arrangements. If it were possible to assemble the data we would expect it to prove that fully ninety per cent of the purchases made in this one line by the far flung automotive industry are "given" (the word is used advisedly) to this one and same XY Company. This XY Company is a comparatively small unit in a large combination of larger units. The XY Company's purchasing power alone would not be sufficient to establish such widespread reciprocal arrangements. It is by reason of the combined purchasing power of all the units in the combination that this one company is so favored. That the practice results in almost absolute control of the business in this line flowing from the one industry, while, at the same time effecting the flow from other industries to a noticeable degree, constitutes a circumstance of potential, social consequence.

On the other hand, the liberties being taken by salesmen are becoming flagrant as well as numerous. For often does the salesman, who has been given an order on a bonafide reciprocal arrangement, attempt to fabricate some sort of reciprocity for his next prospect in the hope of getting his order in the same, easy way. To a manufacturer of engine room equipment, one such easy order seeking salesman proposed that in return for the order, his company would utilize its good offices with its many affiliates to throw this manufacturer considerable business. Such plausible offers have as often as not, proved sufficient bait to get an order; however, in this instance, the engine room equipment manufacturer knew his competition. He knew that one of the affiliates of the salesman's company was his strongest competitor. But the point is, the instance is indicative of the reckless attempts to fabricate reciprocal arrangements which are following in the wake of the other kind of order taking.

The practice needs to be more than damned. It is not sound business practice to begin with; and now it is being stretched to such extremes that it is fast degenerating into the sort of horse trading in which the horse is closely watched weeks for some symptoms of why he was traded. Transcending these reasons, however, is the obvious probability that the practice will soon be the food upon which corporation baiters, in and out of our legislative bodies, will

grow fat and potent. There is handwriting on the wall plainly calling for voluntary, intra-organization "cease and desist" orders.

"F. L. P."

But Here is A Dissenter

OUR article "Reciprocity Be Damned" is rather interesting coming as you say from a purchasing executive of a large industrial organization. He must be connected with one of the large steel corporations that are practicing reciprocity in the most vicious fashion.

He refers to salesmen as "order takers." Reading between the lines he apparently is an order placer and not a purchasing executive—one who places his business hither and yon regardless of quality, performance and price, to satisfy his sales department, one who cannot over-rule the sales department when he knows that by inflicting inferior materials on his operating people, the loss to his company would more than offset any profit his company might make on the order.

Reciprocity is a fine thing when the situation is not dominated by the sales department who are tonnage minded. Reciprocity is a fine thing when it doesn't hurt either party—naturally anyone prefers to spend his money with the same people who patronize his company as long as price, quality and service are equal to what is obtainable anywhere else.

"JUST A P.A."

A Maintenance Man Gives His Views

0 0

YOUR recent comments anent reciprocal buying were very interesting, and I should like to add my opinions to those already expressed. I am a maintenance engineer in a large plant and for rather obvious reasons, I would appreciate it if you would preserve my anonymity.

It seems to me that you've hit the nail on the head when you say "Reciprocity Be Damned" . . . for such it most certainly should be. I'm not a sales manager, nor am I a purchasing agent . . . I'm simply the goat for 75 per cent of this reciprocal buying. For when reciprocal buying is necessary, it is usually supplies for maintenance and other material not covered by blanket contracts, that are usually thrown to the wolves of reciprocal buyers.

Now a maintenance man is somewhat like a car battery. When he works properly nobody knows he's around, BUT when he doesn't work properly, everybody from the president down to the office boy cusses him with gusto.

In some plants, maintenance men are seemingly required to haul valves and oils from out of the surrounding air. Packings and chains are apparently to be created out of blow-off steam, if we may judge by the attitude of most p.a.'s toward maintenance supplies and the alacrity with which they offer these supply orders up on the altar of reciprocal buying.

How many times have I specified Jenkins valve on an order, only to have a piece of "Extra special de luxe" brass junk turned over to me. The reason? "Got to buy from him . . . he buys from us . . . and that's the only valve he carries." There's the real rub in this reciprocal buying business. When reciprocal buying enters the field, all thought of service and quality is subjected to the question of price. I know this to be

Necessary Constitutional Qualifications For Membership in the Unanimous ORDER of Reciprociteers

First: Applicants must possess to a marked degree a QUALITY complex—i.e. a fixed conviction that "pigs is pigs"—a sack of wheat is a sack of wheat—a pair of shoes is a pair of shoes, etc., etc.

Second: Applicants must control a monthly volume of Purchasing Power with an irreducible minimum of \$3; positive control, either personally, through a cousin (the third degree preferable), or through a sister-in-law who has a friend who has a neighbor that works at a drug store. While not obligatory, the applicant having close contacts with a talkative barber is certain to receive rapid advancement in the ORDER.

Third: Applicants must have hearts of stone and at least one sympathetic eye of glass.

Annual Dues: P. A.'s who have never mentioned Reciprocity to salesmen, 5c; Regular or common garden variety of P. A.'s, \$50, just folks, \$1.25.

Eligible to Honorary Membership: All and sundry Vice-Presidents incharge-of Reciprocity.

Objective: No sale of any kind confirmed unless coupled with a purchase of equal dollar volume by salesmen.

Motto: "You scratch my back and I'll scratch yours."

Emblem: A great big stick.

Lodge Supplies: All necessary paraphernalia, including asbestos back protectors, supplied by Shears, Buckroe & Company.

so, for it has happened many times in the past. I know that a little thing like a brass valve doesn't seem to be worth much bother; that it doesn't make any difference who makes the valve . . . when you sit in the office, but to men out in the plant, that valve is very important, and its quality should never be affected for the sake of reciprocal buying.

I don't blame the p.a. for this condition . . . Lord knows I've had it out with him often enough . . . it's the fault of those higher up . . . the men who formulate the policies of the company. Reciprocal buying is a short-sighted economic fallacy that does a thousand times more harm than good. Industry would be well rid of this evil.

If reciprocal buying had no effect on the quality of the material that came through such orders, I wouldn't object to it. But it HAS an effect upon the quality . . . an adverse effect, and as a first class victim of this industrial evil, I humbly appeal for membership in the "Down With Reciprocal Buying Club."

"MAINTENANCE MAN."

. . .

Thinks We Have Started Something

READ your article, "Reciprocity Be Damned," in the Sept. 24 issue of THE IRON AGE. Those three words I have used myself many, many times.

Like the writer of the article—
"An Anonymous Purchasing Director"—so I shall be "An Anonymous Sales Manager," but I am an old friend of THE IRON AGE. Some day, if your plan to be goes through, I shall tell you who I am.

Frankly, I have been disgusted time and again at losing business entirely because of reciprocity; and in some cases—and I can easily prove it, if called upon—I have quoted lower prices and higher quality. If this feature of reciprocity were abolished, as it should be, salesmen representing honest companies could do very much better.

Now, you may have started something; and the thought occurred to me, wouldn't it be a good idea to take the matter up with some sound business men and so form the nucleus of a society to be?

I know you would get many splendid men to join; and as an old and experienced salesman, working with an A-1 concern—and one of your advertisers—I know from experience that the league to be would be a success. Those who did not join would undoubtedly practice the reciprocity idea—and they would rapidly get left.

I wish you could do something to put across the idea of a league. Naturally, being neither a buyer of raw material nor a seller of finished and semi-finished materials, your word would go farther than mine.

"EUTECTIC."

A Terrible Epidemic

N regard to your article on "Reciprocity" and your invitation to comment, would state as vigorously as possible that you cannot accomplish anything of more benefit to both the seller and the buyer than to keep up a campaign to stamp out a most pernicious evil which is doing more to break down the morale of all affected parties than did the evil days of the late depression.

Why should the time of engineers be wasted over a period of months, in many cases, to find out when the order is placed that not a single item of his work had been considered. Not only the engineers at the point of purchase but the salesmen as well are called upon to submit drawings and data, the sales force is kept on the jump and it is all wasted energy as a rank outsider steps into the picture without any experience but with a purchasing power, not direct always, but in many cases two and three steps removed and would have very little, if anything, to do other than to book the order and duplicate what the other fellows have been working so hard to develop, and walks away with the order.

In most cases the equipment is not at all satisfactory to the department called upon to use it, and the equipment gets the minimum attention in maintenance and in a few months like Al Smith's description of a broken platform, "Out the window."

Disagreeable to Both Parties

THE writer is heartily in sympathy with the sentiments of the anonymous writer of "Reciprocity be Damned." I think that it injects a factor into selling and purchasing which is as disagreeable to the purchaser as it is to the seller and which gets both of them nowhere. It takes the time of the higher officials from their proper duties, it leaves the purchaser with disgruntled operating men thereby reducing operating efficiency, and it leaves the seller with discouraged salesmen.

And when all is said and done it cannot make much difference in the long run in the volume of business of either the seller or the purchaser. A certain company because of its size can influence the placing of a certain amount of business through reciprocity, but in the natural course of events that company would obtain the same share of business if reciprocity were not resorted to. In other words, the result is the same in the end except that the purchaser may not get the particular equipment he wants and he may find himself paying more than he should pay.

I happen to know of one case in an extremely specialized field where certain equipment was quoted at approximately \$15,000 to a certain steel manufacturer. A competitor quoted \$8,500 on equipment to do the same work. Because of patented and exclusive design features the \$8,500 equipment could be much smaller and therefore cheaper than the \$15,000 equipment. In addition it was slightly more efficient. The steel manufacturer's engineers selected the \$8,500 equipment strictly on

(CONCLUDED ON PAGE 104)





CONVERSION of a 2high single stand reversing universal plate mill into what might

designated as a combination mill for rolling hot strip for manufacturing tin plate, in addition to producing universal and sheared plates, has been effected by Dominion Foundries & Steel, Ltd., Hamilton, Ont., by adding equipment that converts the mill into a Steckel reversing hot strip mill. The changes made at a comparatively low expense increase the flexibility of the mill to meet in range of output the particular requirements of the plant. The method followed in converting the mill into a unit for manufacturing hot strip, when the tremendous capacity of a continuous mill is not required, is applicable, it is pointed out, to any universal plate mill. The tonnage which can be produced by such a single stand Steckel hot reversing mill, is, however, considerable and may run from 125,000 to 175,000 tons annually when rolling widths of, say, from 24 in. to 36 in.

With the new setup slab ingots 14 to. to 16 in. thick, about 48 in. long, and in various widths, depending on the width of the finished strip, are rolled in a series of passes in the mill down to 12 gage hot strip, thus combining blooming, breakdown and finishing mill operations in one mill unit. All these reductions are made under the initial heat of the steel.

The new mill layout was provided to furnish the production capacity needed in this plant for making hot strip for cold rolling into tin plate without making large investment for new equipment. The plate mill in this plant was being operated only part time, the limitations of the market not permitting full operations. The conversion of the mill into a Steckel mill to produce hot strip so that the mill could be more fully employed and at the same time could produce rolled steel in another needed form, was engineered by the Cold Metal Process Co., Youngstown, which supplied the required new equipment.

No changes whatever were made in the mill itself to convert it into a unit for rolling hot strip by the Steckel process. The mill rolls are 30 in. in diameter and 84 in. long, having a capacity for rolling sheared plate 72 in. wide, being much wider than needed for rolling hot strip. Vertical edgers are located on each side of the mill. Additions made to the mill unit consisted of placing coiling furnaces over the tables and pinch rolls on each side of the mill, these being located between the mill stand and coiling furnaces, and deflector aprons, the latter to guide the strip into the coiling furnace reels. A finished strip coiler is provided in the runout table and also the necessary electrical control equipment for synchronizing the speeds of coiler reels and pinch rolls with the mill.

The ingots are heated in a soaking pit with four openings and from these pits they go to the universal mill, in which they are first given breakdown operations. These are conventional straight rolling operations during which 15 to 25 per cent reductions are made and the ingot is brought down to ap-

proximately % in. thickness. During these operations the pinch rolls are raised so that there is clearance for the steel as it moves back and forth on the roller tables. There is also 18 in. clearance between the bottom of the coiling furnaces and the top of the tables. The distance between the center line of the mill and the center of the coilers is 18 ft.

When the ingot has been reduced to % in the deflector aprons in the table are raised by push-button control and these turn the end of the strip upward and it passes unstrip, but to retain the heat already in the steel.

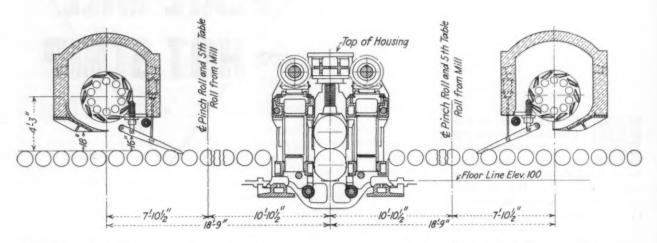
The steel remains in the furnace only momentarily, for as soon as the end of the strip leaves the mill rolls the mill reverses, the pinch rolls are lowered and function and the strip starts on its movement in the opposite direction.

Additional Passes

The strip, after being reduced to % in. thickness in straight univeradditional passes during which it sal mill operations, is given some moves in and out of the coiling out the necessity of any reheating in process and the use of a blooming mill is entirely eliminated. The fact that this work can all be accomplished on a single stand and also the low cost of such an installation indicates, it is claimed, that this type of equipment will have a wide and varied use, not only in Canada and the United States, but also in foreign countries.

Cold Reducing

For reducing the hot strip into cold strip for tin plate, the Domin-



AYOUT showing conversion of 2-high single stand reversing universal plate mill for hot rolled tin plate strip as effected at Dominion Foundries & Steel, Ltd., Hamilton, Ont.

der and partly around a guide roller which also acts as a breaker for secondary scale. After moving around the guide roller the strip takes almost a perpendicular course into the furnace, where the end of the plate flexes around a pedal in the coiling reel within the furnace. The steel moving along the table from the mill stand and into the furnace is coiled on the reel, the speed of which is controlled by the speed of the mill. A load relay is provided for reducing the reel speed as the coil builds up. When the strip comes to a stop after a pass through the mill, the end of the piece is at a point between the mill and the pinch rolls. As the mill is reversed the pinch rolls come down and feed the steel back into the mill. Reversing and lowering of the pinch rolls is automatically controlled.

The function of the furnaces is not to add additional heat to the furnace between passes. While a few feet of the end of the strip does not go into the furnace on one side of the mill, that section, when the direction of travel of the strip is reversed, is the first to go into the furnace and around the coiling reel on the opposite side. For this reason a uniformity of temperature is maintained throughout the entire length of the strip due to the alternate longer heating periods of each end.

After the last pass the deflectors are dropped and the steel passes along the table to the strip coiler.

The mill has a capacity for rolling 10 tons of 12-gage strip per foot of width per hour. This means an output of approximately 25 tons per hour, or 15,000 tons per month, when rolling strip 30 in. wide.

The outstanding feature of this mill is the fact that large slab ingots may be rolled into strip with-

ion company installed a small single-stand reversing cold mill for producing strip up to 22 in. wide and also put in pickling and tinning equipment. Evidently fully satisfied with the method it has adopted for the manufacture of hot strip, the company recently placed an order for another single-stand reversing cold mill to roll up to 36 in. wide. The finished product in the form of cold reduced tin plate is said to have been well received in Canada. Up to the present time Canadian consumers of tin plate ' have been purchasing largely tin plate produced in packs on the conventional type of hot mill; however, the superior quality of the cold reduced plate made from hot strip rolled on the Steckel hot strip mill is said to have been recognized by some of the larger consumers, with the result that the demand is increasing for the cold reduced quality of tin plate.



By FRANK J. OLIVER
Detroit Editor, The Iron Age



THE machine has been accused, and often unjustly, of displacing the worker in industry. On

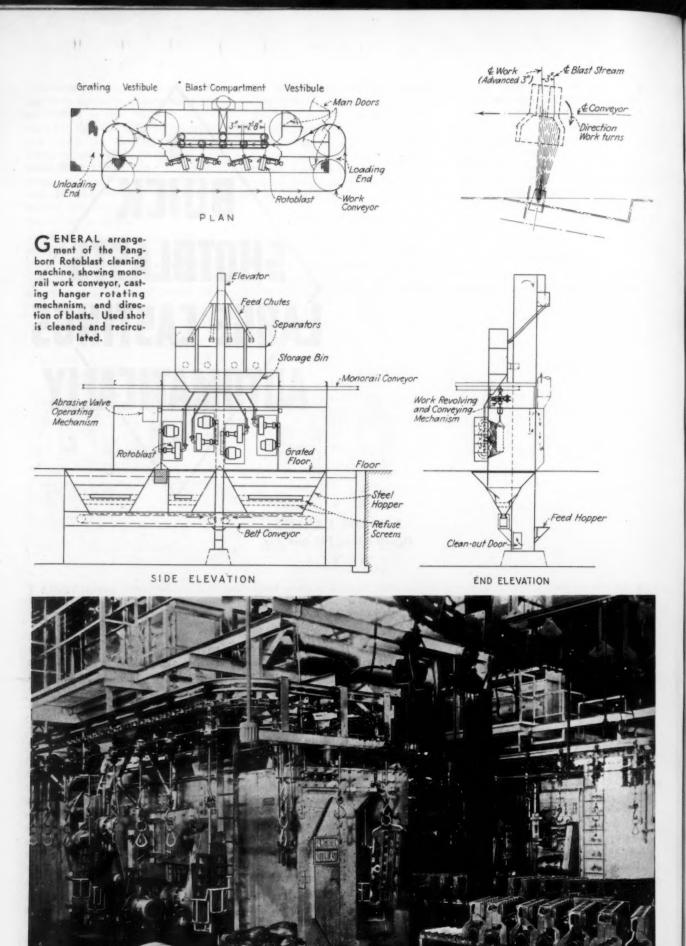
the other side of the ledger, the machine should be credited with relieving much of the drudgery and hazards and dirt and grime and heat from many heretofore unpleasant occupations. One immediately recalls the foundry as hardly the place to serve afternoon tea. But before many years are out, the up-to-date foundry will be as comfortable a place to work in, certainly, as the machine shop is today.

Buick Motor Co. has been one of the leaders in this movement to better working conditions in the foundry. Last year, as part of its \$15,000,000 modernization program, the company eliminated one of the most hazardous jobs around a cupola, that of raking out slag, by installing a water filled trough with drag conveyor to remove the slag which passes out of the back spout continuously. Upon hitting the water this vitreous material shatters into fine particles which are conveyed to a dump. Hoods were placed over the cooling zones on the new mold conveyors to remove steam and noxious gases during initial cooling. Later in the season a complete dust collecting system was installed to further clarify the atmosphere.

In connection with its 1937 model program, Buick again set out on a \$14,500,000 spending spree, modernizing, re-equipping, extending facilities throughout the mile-long works. Once more the foundry came in for its share of the money. This time attention was concentrated in the casting cleaning room, and again on the most hazardous and unpleasant job. Sand blasting is a hand job even though the work is conveyed past the operator by power. There he stands like a diver in muddy waters, helmeted and protected by rubber gloves and apron. while he directs the sand and air stream against the work. Like the diver, he is supplied compressed air by hose, but there is no such thing as an air-tight shoulder fit for such helmets. The worker usually emerges from his heavy armor begrimed with fine dust. The danger of silicosis is ever present and the fatigue factor is high. Men must be worked in very short shifts.

This job is being eliminated at Buick just as fast as the new Pangborn automatic Rotoblast machines can be installed. Two units are already in, a third is on its way. The photograph and line drawing show the unit for cleaning cylinder blocks. There are two such units. The third will clean miscellaneous castings.

Cleaning small castings by centrifugal steel shot blasting is fairly common these days. The work may be tumbled under the blast or it may be conveyed past the rotor wheels, on a circular table. This



FIRST of its kind. Battery of two shotblast cleaning installations in the Buick foundry. By staggering the shotblast rotors vertically and revolving the work before each blast station, it is possible to completely clean cylinder blocks at the rate of over three a minute.

Buick installation is the first of its kind where castings weighing up to 300 lb. are conveyed through the machine by overhead monorail. Several new problems were encountered in handling work of this size—48 in. or more in length. One of these is coverage of the work by the blast; another is sealing of the entrance and exits to prevent shot bounding out into the work room; still another is recirculating the shot and separating the dust from it.

Complete work coverage is accomplished by two design principles: employment of four shotblast wheels mounted at varying progressive heights from the floor, in place of one wheel, and rotation of the work as it is held momentarily before each wheel station. The two top wheels shoot downward at different angles and the two lower ones shoot upward so as to clean the work at all required angles. It is estimated that to discharge the same volume of abrasive by compressed air nozzle blasting would require over ten times the horsepower. The work conveyor, which is an overhead monorail type, is not driven continuously but is indexed one blast station at a time through a crank and connecting rod mechanism which pulls the chain forward during one-third the cycle and lets it stand still during the next twothirds. Usual period of indexing is about 6 sec., blast time 12-15 sec. While the work is suspended in front of each shotblast station, it is rotated on its holding hook 11/4 turns to assure complete coverage in the area of blast. This turning movement is accomplished by means of sprockets on the upper ends of each ball-bearing casting hanger. These sprockets are in contact with a separately driven roller chain which runs the length of the four cleaning stations. It is driven by a 2-hp. motor through a variable-speed drive and can be seen in the plan view.

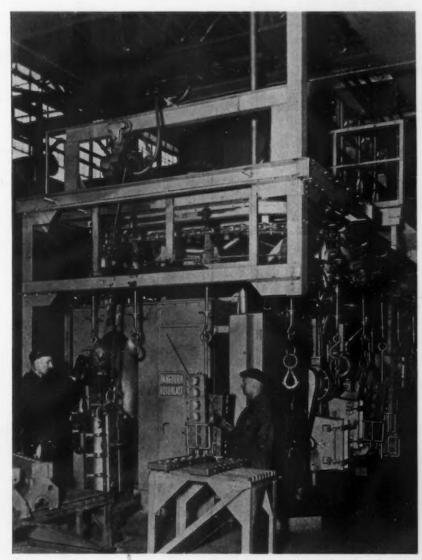
Booth Takes Punishment

While much of the effectiveness of shot blasting depends upon the steel shot ricocheting within the casting itself, a great deal of the shot rebounds to the side walls, floor and roof. This means that the interior of the booth itself is subject to severe abrasion and must be made of readily replaced parts. The back wall, for example, is made of 1-in. boiler plate hung

from the roof and standing off several inches from the side wall proper. The floor is a grating, but loose boiler plates are strewn around to protect it. No special material is used for the casting hangars, which are the only moving parts subject to the blast, except to make them heavy to increase their life. Large manholes

In action, shot is fed by spout to the center of the rotor and is acted upon by both tangential and radial forces. Each rotor is driven by V-belt at 2250 r.p.m. from a 20-hp., 1800-r.p.m. motor, totally enclosed type.

All seals on the cabinet are of sheet rubber held between steel flats. Such seals permit the work



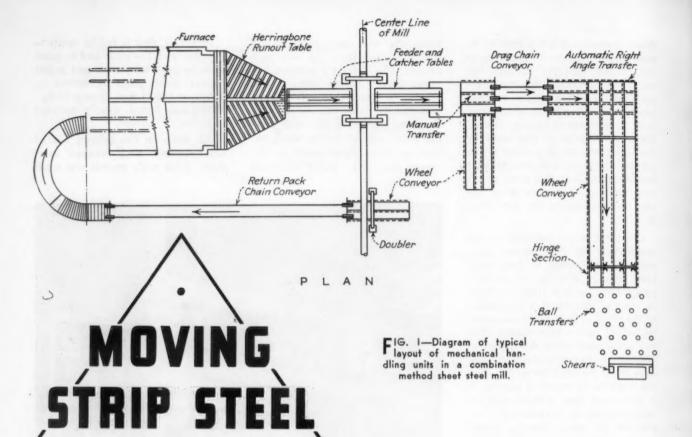
A N air-operated bumper helps remove all shot from the cylinder block after it emerges from the blast room.

are provided so that immediate repairs may be made.

The rotor blades themselves receive the most abrasive action. Four-bladed impellers are used at present, although provision is made for eight blades if desired. They are made of a special alloy developed after years of exhaustive experimentation and are readily replaceable. Blade life is 25 to 40 hours.

to be conveyed through the booth by an overhead monorail which is on top and outside of the booth. Three counterweighted door seals of generous size at each end create two separate air and dust locks that effectively prevent shot from getting out of the blasting room even when large motor blocks are pulled through them.

To make shotblasting effective (CONCLUDED ON PAGE 102)



IT has been said that "all efficient production is a series of functional sequences based upon the idea of a continuous flow." In simpler language this means, "be sure you are right, then go ahead without retracing your steps." Materials handling systems have played a major part in making this ideal practicable. Possibly no better examples may be mentioned than the recent developments in the con-

RODU

tinuous flow principle of producing strip steel. Every step of this development necessarily had to be accompanied by special designs of material handling equipment. The methods described here seem to indicate the logical, common sense way of doing things. Yet this view is often deceptively simple. Things had not been done this way, and at times a great deal of courage was required to adopt the new methods.

later developments of the continuous flow principle, material handling has been a major economic factor. The elimination of manual handling methods and the substitution therefor of mechanical By FRANCIS JURASCHEK Consulting Editor, The Iron Age

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means of conveying the steel from the furnace to and from the mill, and where reheating was necessary back to the receiving end of the furnace, was an absolute necessity in the effective application of the continuous flow principle.

The logical solution of this problem involved the design of special types of conveyors, plus special types of handling equipment designed to effect removal of the material from the conveyors, turning the material around corners, and getting the material into position for the succeeding operation. As worked out in one of the large combination method plants the ma-



ONE of the first forward steps in the continuous production of sheet steel was the de-

velopment of the so-called "combination method". In this, as in all

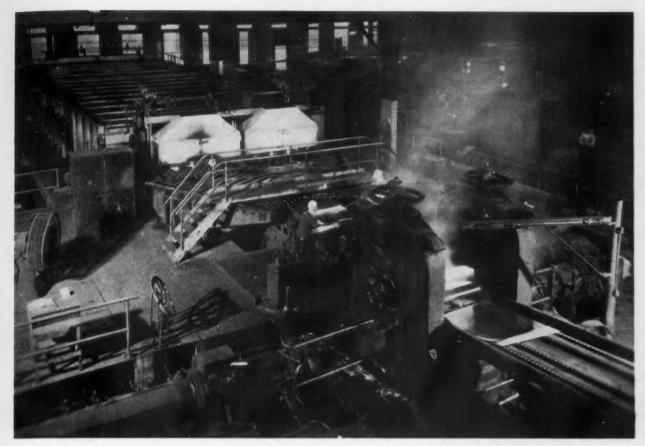


FIG. 2-View in combination method sheet steel mill showing equipment taking sheets from furnace through the rolls.

terial handling system is extremely logical. Fig. 2 illustrates a panoramic view in this plant, showing the operations of part of the mechanical handling equipment especially designed to facilitate the

work. Sheets from the two openings of the furnace are received on a herringbone chain-driven liveroller furnace run-out table, and delivered to an adjoining feeder table feeding the mill in the fore-

ground. From this mill the packs are caught on a catcher table running to a drag-chain conveyor.

This drag-chain conveyor is shown at the right of Fig. 3 leading to an automatic right angle



FIG. 3—Special mechanical handling equipment in a combination method sheet steel mill leading from the rolls to the shears.

transfer table which delivers the packs around the corner to a wheel conveyor (left) leading to the shears. Before the automatic right angle transfer table is reached, however, another wheel conveyor is placed in such a position that, by manual transfer, packs may be removed to be placed on a return pack chain conveyor for return to the furnace for reheating.

Reference to the diagram in Fig. 1 will show the essential simplicity of the entire system, and identify the operations shown in the two illustrations. From the time the sheets and sheet packs enter the furnace, operations are continuous, and the flow of material in process is accomplished with minimum loss of time and of manual effort.

The success attendant upon the construction and installation of this system for combination method production led directly to the solution of problems involved in the handling of coils of strip steel in the continuous process. methods evolved were described and illustrated very clearly in two articles which appeared in THE IRON AGE earlier this year. Both of them will repay re-reading at this time. The first, "Conveyors Applied to Strip Mill Pickling Operations" was printed in the issue of Feb. 20, 1936, and the second, "Hot

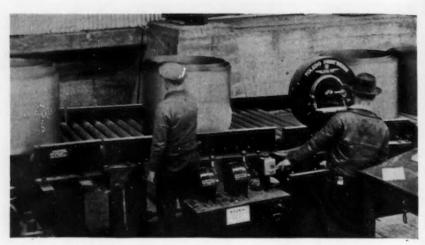


FIG. 4—Weighing scale section of roller conveyor at discharge end of pickling operation.

Strip in 3200 Lb. Coils Handled Over 450 Ft. Conveyor System" in the issue of March 26, 1936. Taken together, they show the great strides which have recently been made in substituting intelligence for human muscle in strip mill handling operations.

One phase of handling which has not received proper attention so far is that concerned with weighing materials during handling operations. Fig. 4 illustrates the weighing scale section of the delivery roller conveyor in a continuous strip mill. As the coils slide along the table they must pass over this

section, and while doing so an attendant merely has to observe the weight indicated on the scale, chalk it on the roll and note it in his record. No manual handling of the coils is required during this whole operation.

Conveyors tie all the operations together into a continuous flow. In the application of this essential principle, conveyors have been designed and constructed for numerous operations involved in the coordination of various operations of sheet and strip steel making. For example, Fig. 5 shows a triple roller conveyor delivering



FIG. 5—Triple roller conveyor delivering sheets to turning section at receiving end of a skin pass mill.

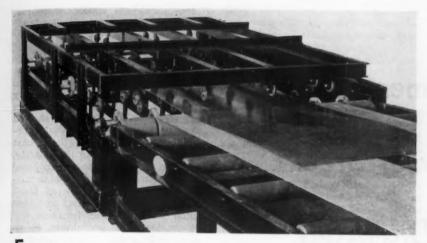


FIG. 7—Special mechanism for handling finished sheets known as a "sheet dryer."

sheets to a special turning section, where the sheets are turned over before going through a skin pass mill. Fig. 6 shows the discharge end of this mill, with the sheets being received on a belt conveyor from whence they are delivered to a roller leveler and then stacked. In Fig. 7 is shown another special mechanism called a "sheet dryer." Placed as a section in the line of continuous flow conveyors, this mechanism handles finished sheets preparatory to the stacking and storage.

The illustrations shown are made available through the courtesy of

Mathews Conveyer Co., which is responsible for the design and installation of all the equipment mentioned.

Air Conditioning Aids Plant Efficiency

A IR conditioned testing departments for insuring greater accuracy of work and more comfortable working conditions for the operators, is being used at West-

inghouse's East Springfield, Mass., appliance manufacturing plant with excellent results.

One of the most important operations to which completed appliances, such as fans, food mixers and vacuum cleaners must be subjected is a final test designed for insuring quietness of operation, and high mechanical and electrical efficiency. The final test is rigorous, and conditions for testing are provided by air conditioning and sound-proofed test booths to insure thoroughness and to completely eliminate outside interference. Sound-proof and practically air tight test booths, requiring ventilation, have been in use for some time. In this system no means were provided for the removal of internal heat created by the appliances and the operators, and, since the temperature rose to an uncomfortable degree, the necessity for conditioning of the air became apparent. At the present time operators are working under ideal air conditions in these booths with a completely controlled temperature. This has been accomplished by means of a central conditioner and a distributing duct system. Since the installations have been made, it has been found that the operators were more alert and better fitted to conduct the tests competently and thoroughly.

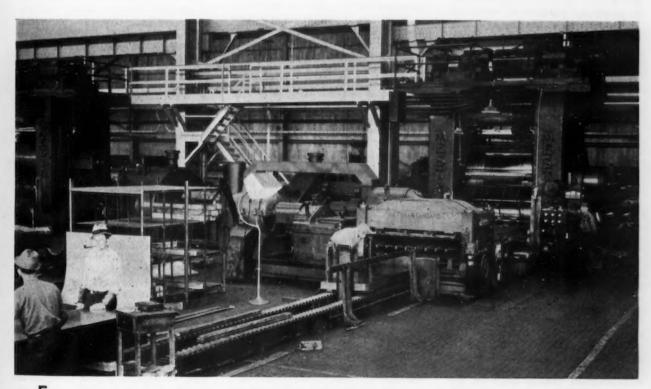


FIG. 6—Discharge end of skin pass mill, with belt conveyor receiving sheets and delivering them to a roller leveler.

Developments in Chemistry of Steel Making Discussed in England

N his presidential address to the Staffordshire Iron and Steel Institute, T. G. Bamford, M.Sc., A.I.C., delivered the following paper at Birmingham, England, on Sept. 29.

Technological progress in the iron and steel industries has been very rapid during the post-war period and has placed the industry in a strong position to meet the demands which are being made upon it at the present time. Alongside the process of rationalization which has been taking place in it as in other industries, there has been a remarkable advance in technique accompanied by no less striking advances in the physical metallurgy, and, lately, in the physical chemistry of steel making. It is difficult for a works director to keep in touch with most recent international research work dealing directly and specifically with his own specialized requirements. Also, it is generally impossible for control officers to sift relevant facts from the enormous quantity of literature bearing indirectly on the problem of their industry, and yet it is essential to efficiency and progress.

User and manufacturer alike must employ trained technical staffs to review technical literature, to investigate processes, often to conduct research work and to submit recommendations whereby specifications and methods of manufacture can be kept in line with scientific knowledge and with modern requirements. The rail-

roads are large consumers of iron and steel. In this connection it is interesting to note the observations made by a leading British railroad engineer. Speaking in 1929 he said: "We pride ourselves today on the fact that it is possible to obtain very sharp limits to the purity of our rail steels. The phosphorus content in basic steel, for example, is reduced to 0.04 per cent, with 0.80 per cent manganese and a carbon content of 0.55 to 0.65 per cent, and yet from the standpoint of wearing qualities we are no better off than we were ten years ago." May this fact not indicate a conservative tendency in adapting specifications to modern knowledge, that is, a conservative tendency on the part of the consumer?

Specifications prior to state that Bessemer steel with more than 0.10 per cent and puddled steel with more than 0.30 per cent of phosphorus may cause hard. brittle although rustless material. At that time the customer made careful demands on all the service properties, without calling for rigid analytical tests. With the developments of more close specifications it was concluded, partly on definitely known results, that a high excess of phosphorus was undesirable for many applications. However, the inference was drawn, quite illogically, that very low phosphorus must in general confer desirable qualities. This belief induced electric steel makers to reduce the phosphorus content to

very low limits which, of course, it was possible to do in the basic electric furnace.

Phosphorus Regains Favor

It is only of recent years that thoughtful voices have spoken against exaggeration regarding phosphorus. In 1926 F. F. Mc-Intosh and W. H. Cockerell showed that phosphorus raised the transverse vibrational strength of cast steel without lowering its tenacity. At the same time they expressed the opinion that phosphorus is misplaced in its usual role of black sheep and steel damager and that fuller knowledge of the facts will demonstrate its usefulness as an element in steel. Walter Lister in his book on practical steelmaking, published in 1928, points out that basic steel may often be far more pure than acid as regards sulphur and phosphorus and yet not give the excellent results obtained from the latter. This he attributes to the nature of the slag in an acid bath which, in his view, rids the steel of almost every particle of dissolved oxygen. The all too anxious desire of the basic steel maker to reduce the phosphorus on the other hand can only be achieved by permitting a high degree of oxidation in the bath, making subsequent deoxidation either in bath or ladle a difficult operation.

K. Daeves, in Germany, has shown that with a phosphorus content of less than 0.03 per cent (apart from entrapped slag) refractory inclusions are formed in basic open-hearth steels quite unobservable in such steels containing more than 0.03 per cent phosphorus. Examining castings from 100 melts he found further that the higher the working temperature and the greater the phosphorus content of the slag the greater the lime ratio and the iron oxide contents of the slag required to cause the sand inclusions.

Phosphorus also appears to exert an independent direct influence on the fluidity of steel castings. Killed Siemens steels containing 0.04 per cent phosphorus are often much more fluid and give much better separation of scum than steels poorer in phosphorus. It is, however, beside the point whether the phosphorus of itself as in cast iron raises the fluidity or whether indirectly the resultant reduced oxygen content prevents the formation of sand-like inclusions. The aim -namely, the avoidance of these non-metallic contaminations-becomes in any case obtainable only by the allowance of a normal phosphorus. According to Ristow, Daeves and Schultz the specification of needlessly low phosphorus limits caused harmful repercus-sions as already explained and also in other ways, for example, in increasing the volume of slag and in reducing the efficiency of the manganese additions. On the other hand, for many applications, some of which are now well known, positive advantages accrue directly from the presence of high phosphorus in steels.

According to Daeves, a steel with 0.20 to 0.30 per cent copper and phosphorus greater than 0.06 per cent is definitely less sensitive to atmospheric corrosion than a steel with equal copper and lower phosphorus. It is believed that the phosphorus causes the copper-rich protective films which form to become thicker and to afford more adequate protection to the steel. Again with 0.08 per cent phosphorus, the unfortunate tendency of sheets of tin plate to stick together is prevented. A still higher phosphorus would facilitate still further the separation of the packs in the rolling, but the simultaneous effect of the phosphorus in raising the tenacity augments the stiffness of the sheets, which is often undesirable for deep drawing particularly.

High Phosphorus Rails Used

A further example of the undesirability of fine limits to phosphorus is given by R. Powell in the mass production of fire-welded articles such as fire-welded spades. A limit of 0.02 per cent was set and faulty welds numbered 10 per cent. Raising the phosphorus to 0.10 per cent reduced the wastage to 1 per cent. A still further increase of phosphorus would induce a tendency to brittleness. For a final example consider the phosphorus limits of railway steels. In all countries during the period from 1888 to 1923 there has been a consistent tendency to reduce the phosphorus limits which in this period were brought down from an average of 0.092 per cent to 0.05 per cent. And yet undoubtedly the phosphorus increases the service life of the metal.

It is beside the point to say that phosphorus increases the tendency to brittleness since fractures of rail steels due to high phosphorus are almost unknown, and bessemer steel with 0.10 per cent is used on Russian railroads, where temperatures fluctuations of 80 deg. occur. Kirknell tells us that no flaws have been detected in rail steels containing 0.12 per cent phosphorus which have been in service for 10 years. It will be evident that in steel the effect of phosphorus is twofold, one directly due to the phosphorus itself and the other an indirect influence due to the resultant reduction of the oxygen present in the molten steel with its

attendant consequences. This leads us naturally to consider the deoxidation of steel, a question long regarded both in America and in Germany as of very great importance, and surely one which is fundamentally a problem in physical chemistry.

The principles of physical chemistry have been applied intensively during the present century and with outstanding successes in the domain of applied organic and inorganic chemistry. It is only of recent years and in limited directions that success has been achieved in their applications to the realm of metallurgy. This is partly due to the supposed complexity of the problems and to the difficulty of obtaining the data essential to the evaluation of the constants used in the generalized equations of the physical chemist.

In investigating, for example, any of the major practical problems connected with the melting and refining of steel it is necessary first of all to determine the physical properties of substances and of mixtures in slag and metal. their melting points, viscosities, thermal capacities, crystalline habits, surface tension and colloidal behavior. In the second place, the equilibrium relationships and energy changes among the many physical and chemical processes which are constantly taking place in the steel bath must be investigated, while no less important is the problem of the rates of chemical reaction in the bath, as for example the rate of elimination of carbon and rates of diffusion of substances through the metal or of transfer between metal and slag.

A very large number of reactions can be conceived as taking place between the substances present in a steel bath and it would be an immense task to investigate them all. Fortunately this is not necessary. Applying certain wellknown laws of physical chemistry and using one particular property known as the free or available energy of each substance, the reactions which will take place and the compounds which will be formed can be stated with certainty and the equilibrium or limiting states toward which they are progressing with the lapse of time as the controlling factor can be calculated with precision.

In this way, Le Chattelier's original view expressed in 1912, that the oxygen always present in liquid steel exists not as uncombined oxygen but as molecules of FeO or at least as an oxide of iron containing one atom of oxygen per molecule, has been proved up to the hilt. Regarding the condition of carbon in iron, the available

data are inconsistent but all of them lead to the conclusion that in austenite, the solute contains one atom of carbon and from 0 to 3 atoms of iron per molecule. In molten iron the indications are that the carbon in solution is combined with iron to a considerable but incomplete extent, and that at 1600 deg. C the average composition of the solute in liquid iron is Fe_sC. Many of the common alloying elements are entirely soluble in liquid iron with which they form no compound in solution. free energies of these elements in molten iron at 1600 deg. C and of their oxides at the same temperature have been computed by Chipman, who has deduced therefrom their capacity for deoxidizing molten steel.

Oxygen Always Present

It is shown that oxygen could never be completely removed even from the deadest of the dead-killed variety. By deoxidizing with aluminum, leaving an excess of 0.01 per cent in steel, the percentage of FeO remaining is down to 0.002 per cent. With as much as 2.0 per cent of silicon, however, the iron oxide remains at almost 0.01 per cent. Sodium, calcium and magnesium would form much more powerful deoxidizers than aluminium. Manganese and chromium have a certain small deoxidizing influence but in this respect are much less potent than silicon. Zirconium is almost equivalent to aluminum as a deoxidizer while vanadium and titanium lie between aluminum and silicon in this respect.

In connection with these theoretical calculations of deoxidizing capacity, it is interesting to notice the work of Weidtmann published in July last on the cutting qualities of differently killed free cutting steels. Pointing out that killed steel is more difficult to manipulate under the cutting tool, he stated that it is nevertheless preferred in many cases when greater homogeneity is essential. In both turning and drilling tests, he showed that the tools wear best with manganese-killed steel and that chromium comes second, with silicon, zirconium and alu-minum following each other in the series. The best deoxidizer, therefore, shows up as most detrimental in its influence on the free-cutting qualities. On the other hand, unkilled free-cutting steels which he tested were red-short on working. All the steels tested, which were Siemens-Martin steels and manufactured under similar conditions. had of course high sulphur contents of some 0.02 per cent, and it is well known that for this reason such steels are more prone to red

brittleness than normal Siemens-Martin steels without high sulphur content. What Weidtmann showed was that the killed steels of high sulphur content which he tested were in this respect in general equal to normal unkilled steels.

The oxygen content of the steels appears to have other vital influences on the properties of the metal and in fact to influence its behavior during working, under heat treatment, and in service for its whole life. This fact has been recognized in Germany for many years; it is absorbing the close attention of American steel makers and users, and our own manufacturers and research workers are by no means lacking in the thought which they are giving to it.

It is increasingly plain that the principal factor of what is known as "body" in steel is the grain size or grain growth characteristics. It is quite generally held that submicroscopic refractory particles, mainly oxides, are the cause of fine grain. Usually a whole heat of steel is either coarse or fine grained. Steels of fine grain are shallower hardening and carburize less deeply than coarse grain. However, even for carburizing steel, fine grain may have decided compensating advantages. After carburizing, the core of a fine-grained steel is tougher and shows considerably higher impact resistance than a coarse-grained one.

Both the core and the case of fine-grained steel remain so even after prolonged heating in the carburizing process, so that a core refining treatment is unnecessary and the carburized articles may be quenched directly from the carburizing temperature. Fine-grained steels have a much wider heat treating range, because the austenite which is produced does not coarsen as is the case when a coarse-grained steel is heated. Fine-grained steels are less embrittled by cold work. This property is of advantage in punching heavy sections and in heavy reductions by cold rolling, and fine-grained steels have higher impact resistance at low temperatures. It is also stated that they flow more readily in forging and show less forging defects.

Positive Production of Grain Size

Given ordinarily good furnace practice, positive production of coarse or fine-grained carbon steel at will can be obtained by controlled ladle addition of aluminum and a controlled reactive oxygen content, which in turn depends largely upon the carbon, manganese and silicon content of the steel. For a range of carbon steel between 0.15 and 0.50 per cent, and

for manganese of 0.50 per cent and above and silicon of 0.15 per cent and above, Epstein, Nead and Washburn state that a fine-grained steel was invariably obtained by them with an aluminum addition in the ladle of 1 lb. per ton. Production of intermediate grain size requires reduction of reactive oxygen, which can be brought about by using a higher content of manganese and silicon. From observations made earlier in this address it would appear that other elements such as titanium and zirconium might be used as substitutes or be used in conjunction with aluminum.

There is considerable evidence for believing that the ageing of steel or gradual change in properwhich takes place after quenching and after cold deformation, is influenced to a considerable extent by the oxygen content of the steel. As examples of ageing may be mentioned the gradual apparent toughening after rolling of medium and high-carbon steels such as rails, the increase in hardness of freshly quenched tool steel in the period of perhaps a week after hardening, the loss in coercive force accompanied by increased maximum induction in permanent magnet steels following hardening, the change in magnetic properties in quenched carbon steels on ageing or tempering at low temperatures.

Apparently the carbon of martensite is gradually precipitated after ageing even at room temperatures, so that the alpha iron assumes the normal unstressed cubic lattice with a resultant decrease in hardness and increase in the magnetization of the specimens under test. The decrease in magnetization taking place at 300 deg. C has been attributed by Sandford to the formation of cementite precipitated from martensite, but in the first place not fully combined with alpha iron to form Fe3C. While everyone might not entirely agree with Sandford's explanation, it is now generally assumed that the cause of ageing is the disintegration of super-saturated solid solutions and of the precipitation along grain boundaries and along certain crystallographic planes of a solute in sub-microscopical dimensions. Oxygen apparently influences the precipitation of both carbon and nitrogen and, therefore, has a triple influence on the age hardening properties of the steel. The susceptibility of normalized rimmed steels to quench-ageing is very In the semi-killed steels, according to bulletin No. 66 of the Metallurgical Advisory Board, this ageing is considerably less while steels killed with aluminum quench-age very little.

In all respects the most complicated and in some ways the most interesting example of ageing is that of "strain ageing," the basic cause of which seems also to be responsible for "blue brittleness" and also for the extraordinary hardness which develops in steel while being rolled or drawn in the temperature range around 200 deg. C. Instead of acquiring only the usual and familiar increase in hardness after cold work most low carbon steels continue to harden and to lose ductility for some time during the ensuing weeks in storage. A degree of cold work corresponding to 10 or 15 per cent reduction causes the most intense changes during ageing. The rate at which the changes occur in this, as of course in all types of ageing, increases with rise of temperature. But hardening is outstandingly rapid in strain ageing at temperatures so low as to give no indication of any final softening in a very long time.

The most striking example of this effect is that of rolling under conditions wherein the heat of deformation raises the temperature into the rapid ageing range. In successive passes, the metal becomes very hard and the reduction in thickness is accomplished only by considerably increasing roll pressure. If the metal is kept below the ageing temperature, lower roll pressure suffices to effect even greater deformation. Similar phenomena are shown in wire drawing and useful advantage is often taken of them when higher strength is desired in the product.

Remedy for Stretcher Strains

Even at room temperature, hardening of much less intense nature does take place under deformation. However, in the ordinary annealed low-carbon steel, for instance, of the rimming type, this is preceded, remarkably, by weakness in metal which has been deformed only slightly. In deep drawing or stamping, parts of the metal which have commenced to yield immediately develop weakness, and zones of sudden marked elongation called "stretcher strains" are formed. The remedy is simple. Any sort of cold deformation, even slight, which positively causes a small but definite slip in each grain takes them through the stage of weakness and removes the ten-dency to sudden local yield. This is accomplished by a stretcher levelling, a pinch pass, or roller levelling. At this point, however, the element of ageing enters. The effect of these light cold working treatments in destroying the marked yield point soon wears off. A few weeks at room temperature (CONCLUDED ON PAGE 102)





Left-Fig. 1.

Above-Fig. 2.

New Variable-Speed Transmissions Have Wide Applications

ARIABLE speed transmission involving five major parts, unit housed, is announced by Graham Transmissions, Springfield. Vt. The unit is approximately motor size and furnishes any desired output speed from halfmotor down to zero and reverse. The range of speed is accomplished through a single turn of a control wheel. The motor may be built-in as shown in Figs. 1 and 2 or it may be connected by flexible coupling, with the motor and transmission unit-mounted on a common bedplate. If desirable, power can be supplied from a lineshaft or other source, using a high-speed shaft extension instead of a motor. Design permits that a geared head may be incorporated in the drive at the output end providing a reduction up to 7 to 1 or a step-up as high as 1 to 4.

Referring to Fig. 2, the carrier, 1, of course rotates at motor speed. This member supports three taper rollers, 2, which are kept in intimate contact under pressure with a non-rotating ring, 4, and thus must turn at motor speed, times the ratio of the ring and roller diameters at the point of contact. The three rollers carry planet pinions which mesh with a nonmetallic internal gear, 3, which is connected to the output end of the unit, thus providing a step-down ratio combined with speed variation. This variation is obtained by moving ring, 4, along the taper rollers, thus changing the diameter ratio of these two members. In this way, infinite speed range plus reverse is combined in one unit. The transmission operates equally well in either direction of rotation. It can also be driven from the output end, where a slow-running line shaft is required to supply power at variable speeds to a high-speed machine.

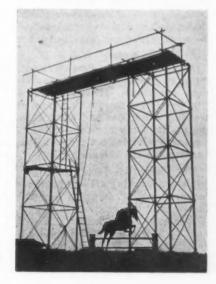
Since the entire range of speed is obtained with only a few pounds pressure with a single turn of a wheel, remote control by pressure or tension device, cam, pilot motor, Selsyn, etc., is entirely practicable. The curve between the motion of the control rod, 5, and output speed, is substantially a straight line, which simplifies automatic control.

A "jogging" control, for cyclic operations, with utility for "inching" as well, in no wise interferes with pre-set speed and does not require stopping of the motor.

Availability is in three standard sizes with a range of capacity up to 7½ hp.; and in two-speed ranges, normal and extreme. Either may be had with or without geared heads.

Steel Scaffolding in Overhead Photography

A 26-ft. steel scaffolding upholding a platform on which a camera was mounted enabled the author of a new book on riding to illustrate principles of jumping by overhead photography. Incorporated in Benjamin Lewis' book, "Riding" (Derrydale Press, New



York), the series of action studies obtained by this method are unique.

Success of the experiment depended upon the horse's emotional reaction to being ridden through the inner confinement of the superstructure and made to take the hurdle thereunder. Naturalness of conduct was essential, and factors inducing nervousness in the animal had therefore to be excluded. The type of scaffolding used, combining such qualities as lightness, rigidity, minimum visibility, etc., succeeded where a bulkier material, such as wood, would have failed.

Known as Tubelox scaffolding, it is the patented tubular steel product of the Chesebro-Whitman Co., Inc., New York, and while here depicted in a somewhat unusual role, is essentially adaptable to a range of purposes. Its most common use, however, is for temporary structures incidental to the actual construction, repair, decoration or other treatment of a building.

The scaffold Mr. Lewis employed, shown in the accompanying cut, measured 26 ft. in height, 29 ft. along the ground, 7 ft. in width and had a center opening of 15½ ft. It was erected in sections from standardized Tubelox scaffolding members taken to the site before being assembled. After use, the structure was dismantled and the parts returned to the manufacturer for rental or sale to a subsequent customer.

Production of pipe in Soviet Russia improved considerably last year, according to unofficial in-formation received by the U. S. Department of Foreign and Domestic Commerce. Pipe production is expected to exceed 1,000,000 tons during 1936, a tonnage 14 times as great as was produced in Russia in 1917, the report states. During 1935, six new mills commenced operations, and have been producing small seamless tubes for the engineering industry and drilling and pressure pipes for the oil industry. The Mannesmann mill at the Liebknecht plant makes oil pipe lines and gas and water



F. R. HOADLEY

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HE fortieth annual convention of the National Founders Association opened on Nov. 18 for a two-day session at the Waldorf-Astoria Hotel, New York. Some 150 members attended the gathering, which was presided over by Thomas W. Pangborn, president. Before the series of formal discussions began, A. E. McClintock, commissioner for the association, discussed the organization's growth and revealed that 315 industrial plants now constitute its membership. During the past year 10 new plants were enrolled, 10 were reinstated to membership and eight resigned. Applications to join from five additional plants are pending, the commissioner reported.

The program which followed dealt realistically with modern business and industrial problems, placing greater emphasis upon the broad economic outlook than upon technical or other considerations particular to a specific industry. In general, the conditions laid down were these: The country has recovered substantially from the depression, but future progress depends upon a realinement of Government. management and labor along a united front. Industry's responsibility to the public welfare is greater now than it has been, because the election proved that control over the working classes has passed to the hands of the Government and industry's essential function of producing more and better goods in an uninterrupted flow has accordingly been rendered more difficult.

There is never an excess of production nor an excess of effective workers, since the needs of the population, in line with a rising standard of living, are endless. To

Labor Policies Stressed at

serve these needs efficiently and fully, a sound, cooperative relationship between Government and business must be established. Each has to recognize its own functions and respect its limitations, but with respect to labor and the low income groups generally a joint plan of action for their security and preservation must be worked out.

The depression taught people to fear poverty, and the election therefore was a political expression of their desire for maximum security. Business cannot promise as much security as can Government, but offers more opportunity. With returning prosperity, hope tends to replace fear in the minds of the masses, sentiment swings toward individual opportunity and achievement, and business is to some extent reinstated.

Management's neglected duty is to sell itself to the public better than it formerly has. Employee representation plans are a step in the right direction, and, where instituted, have met with success. The steel unionization drive, now being conducted by John L. Lewis' Committee for Industrial Organization, is not likely to succeed because privileges of the closed shop are costly to workers, whereas no fees are levied under representative bargaining. Another obstacle in the path of unionization is the sense of distinction and class consciousness between skilled and unskilled labor groups.

Steps taken by management, such as casualty insurance, accident prevention, retirement benefits, protective measures, improved working conditions and other safeguards not only cement employeremployee relations but reflect better earnings on the balance sheet.

The essential facts are that, while the working classes have demanded greater security, and the Government has promised to supply it, business and industry will still have to bear the brunt of the load, as only by hard work and sustained productive effort can these promises be kept. Although collectivist

characteristics are cropping out in the Government, private industry remains the dominant supplier of both goods and jobs. Everyone will have to work as hard as ever. The problem is to get the unemployed back into the running, or as large a percentage as possible.

Business and Government

The opening session of the convention introduced the association's president, Thomas W. Pangborn, Pangborn Corp., Hagerstown, Md., as speaker. Under the subject "What Kind of a Government Does the Business Man Want?" he cited industry's desire for its "relations with Government to be on a sound, friendly and sympathetic basis. Government can never treat private business fairly unless it recognizes the value and worth of our competitive system of industry and trade." Mr. Pangborn added that the functions of Government were political, not economic, that it should keep the channels of trade and industry open by intelligent policing methods but shouldn't restrict the flow of business by itself engaging in competition with industry.

Its primary function was said to be maintenance of order, although minor disputes as sometimes arise in local industrial areas should not be construed as an occasion for enacting legislation in the form of a Wagner labor relations bill. The speaker concluded that business' relations with Government should be established upon a basis of mutual cooperation and understanding.

Dr. Virgil Jordan, president of the National Industrial Conference Board, Inc., declared that, as a result of the economic and political upheaval occasioned in this country by a protracted business depression, a "new epoch of American experience" had commenced. "The recent election gave final and decisive confirmation of this change. In it the American people, of all parties and of all classes and conditions, including many business

Founders Convention

men, have voted unmistakably and almost unanimously for security, stability and uniformity." The old ideology had embraced "principles of individual effort, thrift, enterprise, adventure, risk, diversity of capacity and accomplishment, and personal responsibility for prosperity and security."

Dr. Jordan contended that the state had undertaken to meet the popular demand for greater security and prosperity in a systematic way and would undoubtedly persevere in its efforts. He affirmed that the necessary administrative ability would develop in response to the need for it. The consequences of the policy of centralized economic control, by which the state would fulfill its obligations, were next described. A progressive contraction of private property ownership was predicted. This growing "col-lectivist effort," as the speaker called it, might, however, come to grief owing to the difficulties and waste of centralized administration in its early stages.

Responsibility of Private Industry

The problem of "maintaining general productivity in the whole working organization" was declared to be basic and one in which private industry would have to supplant legislative function for the next five to 10 years at least. Management's chances of surviving, Dr. Jordan affirmed, depended on its meeting this responsibility. He cautioned particularly against letting "speculative optimism" run away with the present returning prosperity trend and so bring on a new boom-depression cycle.

Considerable discussion from the floor followed this speech, several listeners taking exception to Dr. Jordan's views on the grounds that he had drawn a darker and more serious picture than the facts warranted. He replied that he could only hope time would prove the criticism correct.

The meeting then adjourned for luncheon, toward the close of which an interesting and informative talk on "Gas Hazards in Modern Industry" was delivered by Dr. Howard W. Haggard, associate professor of applied physiology, Yale University. In the afternoon Arnold Lunn of the University of Notre Dame spoke vividly on the "Communist Peril in Europe."

National Founders Association Officers and District Committees 1936-1937

ELECTIONS of officers and district committee members concluded the sessions. Franklin R. Hoadley, Farrel-Birmingham Co., Inc., Ansonia, Conn., was elected president to succeed Thomas W. Pangborn. William D. Hamerstadt, Rockwood Mfg. Co., Indianapolis, was elected vice-president. A. E. McClintock and J. M. Taylor, both of Chicago, were retained in office as commissioner and secretary-treasurer respectively.

Mr. Pangborn, Pangborn Corp., Hagerstown, Md.; Gen. Thomas S. Hammond, Whiting Corp., Harvey, Ill.; and S. Wells Utley, Detroit Steel Casting Co., Detroit, were given honorary membership.

Seven district committees of five members each were approved.

His remarks were followed by an address by Whiting Williams, the title of whose speech was "Getting the Cooperation of Employee-Citizens." Mr. Whiting spoke from a broad background of personal observation and experience, declaring that, in the present contest between Government and business for cooperation of the worker, he hoped



T. W. PANGBORN

. . .

business would win, since in the long run it would benefit the worker and the country more. Government and organized labor agitators gained favor as a result of the depression because the experiences of six long years of worry and privation taught the working classes to fear poverty and insecurity.

"The wish for maximum security and prosperity," as typified by the sweeping indorsement at the polls of the incumbent administration, "was a natural reaction to this experience." The speaker added, however, that returning prosperity would reestablish business leadership to some extent anyway. "In practice little things often count for a great deal," it was stated. "Workers fear the loss of their jobs through some unjust cause. Improving their jobs often means improving them as citizens."

Conflict Between Classes of Labor

Management ought to devote more time and attention to these problems, Mr. Whiting affirmed, this being the way to combat unionization activities and other interference. "As a rule skilled labor won't support vertical unions because class consciousness is intensified by leveling skilled salaries to unskilled salaries, leading to class conflict." Management ought to inquire, however, whether foremen and skilled workers are today getting pay, relative to unskilled wages, that they got in 1929. "If not, the former will feel forced to join vertical unions."

J. A. Voss, director of industrial relations, Republic Steel Corp., spoke of the success of the employee representation plan in operation at Republic's various plants. He said that the plan permitted

collective bargaining in the truest sense of the word, that "last year 76 per cent of the questions raised by the men were settled in their favor." Whereas the closed shop worker has to pay for the right to get and hold a job, under a representative arrangement benefits accrue to the employees without any expense whatsoever. Among these benefits were cited "shorter hours, vacations with pay, safety precautions, wage increases, time and a half overtime, physical improvements, disability insurance and other advantages." As a result workers in the steel industry haven't taken kindly to the drive by outsiders to organize them, Mr. Voss asserted.

The economic value of accident prevention, casualty insurance, unemployment compensation and security measures generally calculated to improve the worker's lot was outlined by Roger Williams, New York City, who spoke on "Other Controllable Costs." made the assertion that legislative action in regard to these matters had been directly invited by management's past neglect, and that the costs of such insurance had correspondingly increased. It was pointed out that the way to control these costs was for management to strive to represent itself directly in all such matters.

Micrographs of Cast Iron Fractures

Prior to Mr. Williams' report, a paper prepared by Dr. Francis F. Lucas of the Bell Telephone Laboratories, Inc., entitled "A Precision High Power Metals Microscope and Its Application to the Study of Fatigue Cracks in Cast Iron," was read by Dr. Ralph M. Sample, a colleague of Dr. Lucas. Slides of the instrument and micrographs, taken with it, were projected on a lantern screen during the discussion. Effective magnification of from 4000 to 6000 diameters, obtained with the instrument, revealed clearly minute imperfections and cracks in specimens of cast iron projected on the screen.

In the interval between this report, which, incidentally, opened proceedings on the second day of the convention, and Mr. Williams' discourse, Philip Drinker, professor of industrial hygiene, Harvard School of Public Health, talked of "Uses and Limitations of Respiratory Protective Equipment." Prof. Drinker utilized the projection lantern to illustrate his subject with pictures of various gas masks, respirators and other equipment in common use today. He gave his listeners valuable advice on silicosis prevention, general health safeguards and relevant considerations.

A part of his speech was devoted to technical discussion of the chemical and physical properties of typical air samples secured in foundries and other establishments.

The concluding paper of the preceding day, entitled "Today's Business and the Public," was

presented by C. J. Stark, president, Penton Publishing Co., Cleveland. Mr. Stark spoke briefly but interestingly of the need for "enlightening the public as to the works and achievements of private industry and of keeping all classes informed of its doings."

Machine Tool Trade Higher In October

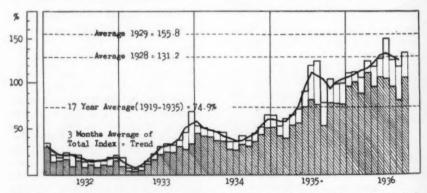
HE National Machine Tool Builders' Association, in its report for October, shows a gain of 15 per cent in business over that of September. The October index figure was 136.5 against 118.5 for September. A significant development is that domestic orders have risen while foreign orders have declined. Export business in October represented 23 per cent of the total, but was below that of September.

Distribution of orders throughout the industry is the best on record, according to the association. More than half of the companies report bookings equal to or better than their 1926 average monthly shipments, which are taken as the base for the association's index.

In the trend of orders the association sees indications of the improvement in business that has occurred in the whole group of metal-working industries. growing demand for tools has occurred in a series of steps, as additional industries or groups of industries have come into the market for new equipment. The third of such steps has now held, with minor fluctuations, since January, "an indication," says the association, "that a fairly broad group of user industries have been anticipating increased or more economical production; perhaps both. This is confirmed by the strong uptrend in production of basic ma terials, such as pig iron, steel, zinc and copper. Weighing these production indexes against the machine tool orders, the strength of demand reflected in the October index (machine tool) leads us to look for the formation of another step above the present one not far ahead."

German Machinery Men Visit U. S.

PARTY of 50 Germans, members of the German Machine Builders' Association, representing machine tool builders, steel companies, locomotive works and allied lines, arrived in the United States last week to visit several industrial plants in this country and the National Exposition of Power and Mechanical Engineering, Nov. 30 to Dec. 5, at the Grand Central Palace, New York. The itinerary took the visitors to Philadelphia, Pittsburgh, Chicago, Detroit, Cleveland, Rochester, Syracuse, Endicott, and Brooklyn, where they toured such plants as the Baldwin Locomotive Works, Westinghouse Electric & Mfg. Co., Joseph T. Ryerson & Son, Inc., General Motors Corp., A. B. See Elevator Co., Inc., International Business Machines Corp. and others.



NDEX of machine tool orders shows the proportion of foreign business, the shaded area representing domestic business and the unshaded area export trade.

Acetylene Association Meets at St. Louis

5 T. LOUIS, Nov. 20.—More than 3000 members and guests attended the 37th annual convention of the International Acetylene Association, held at the Hotel Jefferson, Nov. 18-20.

C. D'W. Gibson, assistant vicepresident, Air Reduction Co., New York, was elected president, and Elmer H. Smith, Commercial Gas Co., Minneapolis, was named vicepresident. Henry Booth, Shawinigan Products Corp., and H. F. Reinhard, were reelected treasurer and secretary respectively.

New directors are: C. O. Epperson, National Cylinder Gas Co., Chicago, and retiring president of the I.A.A.; H. S. Smith, Union Carbide Co.; W. C. Keeley, National Carbide Corp.; and H. B. Dolisie, Canadian Liquid Air Co., Ltd.

Papers and addresses at the eight sessions numbered more than 30. A welding and cutting forum at the Soldan High School Auditorium was well attended, and a new feature was the welding and cutting round table discussions held on the evening of Nov. 19, also at the Soldan school. The latter consisted of a brief general session followed by nine individual group meetings, at which more than 45 engineers, recognized authorities in their fields, served as guest technical advisers. All of these group meetings were well attended, but especially those devoted to discussion of the welding of high and low-alloy steels, hard facing, and the welding of non-ferrous metals.

Jacobus Gets Morehead Medal

Features of the opening session included the keynote address by P. W. Swain, editor, *Power*, and presentation of the Morehead medal to Dr. D. S. Jacobus, consulting engineer, Babcock & Wilcox Co., New York, for advancing the recognition of the oxy-acetylene process by regulatory bodies.

Speakers at the welding and cutting forum, which included demonstrations of oxy-acetylene welding and cutting and the Magnaflux and other testing of welds were: John J. Crowe, research engineer, Air Reduction Co.; Dr. A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Laboratories, Inc.; Prof. H. L. Whittemore, chief, engineering mechanics section, National Bureau of Standards; H. E. Hicks, chief engineer, Modern Engineering Co., St. Louis; J. I.



D'W. GIBSON, asident, Air Reduction
Co., New York, who was
elected president of
the International Acetylene Association at
St. Louis.

Banash, consulting engineer of the I.A.A., and W. B. Browning, service engineer, Linde Air Products Co., Chicago.

General Industries Session

A general industries session, with A. E. Gibson, vice-president, Well-



H. F. REINHARD. since 1931 secretary of the International Acetylene Association, with headquarters at 30 East 42nd Street, New York.

man Engineering Co., and president of the American Welding Society, presiding, included papers by I. T. Hook, American Brass Co., on "Welding of Cupro-Nickels and Silicon Copper Alloys" and by Berthoud Clifford, vice-president, Radiant Fuel Corp., St. Louis, on "Oxy-Acetylene Welding in Plant Construction and Maintenance." Erik Oberg, editor, Machinery, spoke on "How Design for Welding Defers Obsolescence and Increases Profits."

Five papers were presented and discussed at the heavy industries session on the afternoon of Nov. 19. They included an interesting outline of "Stack Cutting of Plate Steel for Cars," by B. F. Orr, superintendent of car shops, Big Four railroad, Beech Grove, Ind., and "Oxy-Acetylene Cutting in the Production of Heavy-Duty Dirt Moving Equipment," by R. G. Le Tourneau, president, R. G. Le Tourneau, Inc., Peoria, Ill. Applications of welding and hard facing in the maintenance of mining machinery were outlined by G. S. Jenkins, superintendent, Consolidated Coal Co., St. Louis, and "Oxy-Acetylene Welding Practices in the Metal Mining Industry," by H. R. Wass, St. Joseph Lead Co., Bonne Terre, Mo. Potentialities of welding in the construction of movable dam gates, navigation lock gates and similar heavy steel structures were discussed by C. H. Ellaby, civil engineer, United States Engineer Department, St. Louis.

Piping Problems Discussed

The closing session of the meeting, with F. C. Fantz, vice-president, Midwest Piping & Supply Co., St. Louis, chairman, was devoted to the piping industries. Speakers included S. T. Seeley, sales engineer of the Midwest company, and W. A. Benoist, engineer, Anheuser-Busch, Inc., the latter on power plant piping. Data on oxy-acetylene welding in the operation and maintenance of pipe lines were given by R. P. Gonzales, Arkansas-Louisiana Gas Co., Shreveport, La. Progress in pipe line construction was outlined by T. R. Jones, president of the company of the same name, Dallas, Texas, and standards for quality of welding for power piping were discussed by W. D. Halsey, Hartford Steam Boiler Inspection & Insurance Co.

On the morning of Nov. 19, more than 200 members and guests visited the plant of the Midwest Piping & Supply Co. where the production of welding fittings and the fabrication of large and small pipe assemblies, including the welding of alloy steel units, were to be seen.

Increase in membership in the

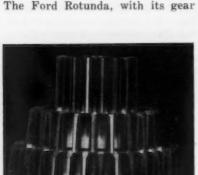
association to a new high point was reported. Further notes on the convention proceedings, with more detailed reference to the papers, will be included in a forthcoming issue of The Iron Age.

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Detroit Exhibits Machine Age Art

ARGELY through the instigation of Edsel Ford and through the cooperation of the Michigan Tool Co., the Detroit Institute of Art has been holding a Machine Age art exhibit during the past few weeks. Walter Dorwin Teague, well-known commercial artist, planned the general arrangements, the main purpose of which was to indicate that the geometry of the machine is repeated in its products. New tools, new materials and new functions have produced a new style, for after all, these three factors determine form in any art. The exhibit tends to prove that any machine or tool that is designed functionally correct is truly artistic and that such machine and tool forms can be used directly as patterns for those objects with which we come into contact in our daily lives. Dress costumes were exhibited to indicate that modern styles echo the simplicity of modern machine design. Furniture designed by Teague and loaned from the Ford Rotunda showed reflections of bridge trusses, streamline trains, and setback skyscrapers in their general form.

Other interior decorations indicated that simple functional forms are truly artistic in home furniture as in machines. In this group a table cen'erpiece composed of a Ford flywheel gear and transmission cluster seemed not at all out of place. Modern architecture was also shown as repeating the functional directness of machine design. The Ford Rotunda, with its gear



(A)

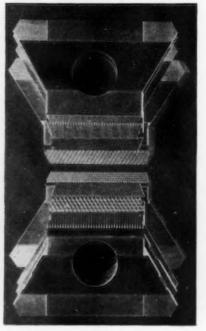
shaped form, is such an example. Since we live and work among machines, it is not surprising to find that kitchen appliances are now becoming truly artistic as the design tends to a more functional form.

Determines Expansion Of Pb-Sb Alloys

THE thermal expansion of leadantimony alloys containing from 2.9 to 98.0 per cent antimony has

S OME simple tool forms that lend themselves as patterns for modern art: (A) Cluster of shaper-type gear culters which have been reproduced in glass as a table centerpiece or as a building; (B) Group of gear shaver tools which have furnished inspiration for modern art; (C) Gear hobber blanks stacked in the only way possible for stability lend a new motif to column design for modern furniture.

Photos by courtesy of Michigan Tool Co.



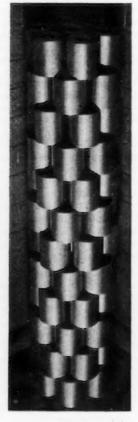
(B)

been determined by Peter Hidnert of the thermal expansivity section of the National Bureau of Standards.

The temperature range covered was from 10 deg. F. to 392 deg. F. The author has deduced five equations which give relations between the coefficients of expansion and the chemical composition of the various alloys investigated. These equations show that the coefficients of expansion decrease linearly with an increase in the atomic percentage of antimony. The densities of the lead-antimony alloys also decrease linearly with an increase in the atomic percentage of antimony.

The linear relations between the coefficients of expansion, or density, and the chemical composition (atomic per cent) are typical of relations for other properties of binary alloys having structures composed of solid solution plus eutectic.

The coefficients of expansion cover a wide range of values and it is possible to select an alloy having the same coefficient of expansion as iron, nickel, gold, copper, silver, aluminum, magnesium and many of their alloys.



(C)

Consumption of Ferrous Scrap And Pig Iron in 1935¹

By RICHARD J. LUND and H. W. DAVIS

THE large importance of ferrous scrap as a basic raw material in the iron and steel industry is illustrated by the industrial consumption of 26,415,000 gross tons of this material in the United States in 1935, compared

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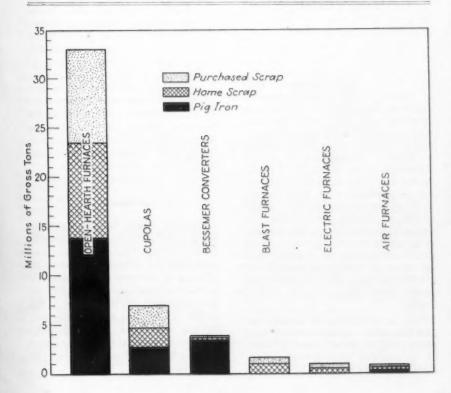
¹Published by permission of the Director, U. S. Bureau of Mines.

with 20,505,000 tons of pig iron, according to a survey recently completed by the United States Bureau of Mines. The total scrap figure includes almost equal proportions of home or plant scrap and purchased scrap, the tonnage of the former amounting to 13,347,000 tons and of the latter 13,069,-

Consumption of Ferrous Scrap and Pig Iron in the United States in 1935, by Type of Furnace

	Number		Scran		Pig
Type of Furnace	of Active Plants Reporting	Home (Gross Tons)	Purchased (Gross Tons)	Total (Gross Tons)	Iron (Gross Tons)
Open-hearth	127	9,589,017	9,530,610	19,119,627	13,944,239
Bessemer	. 30	212,862	6,452	219,314	3,542,719
Electric	217	464,783	450,776	915.559	33,186
Cupola	2,287	1,916.835	2,241,788	4,158,623	2,675,827
Air	115	278,140	168,103	446,243	295,008
Crucible		244	609	853	566
Puddling	5	1,371	4,020	5,391	13,492
Blast	67	883,500	666,220	1,549,720	*****
	12,858	13,346,752	13,068,578	26,415,330	220,505,037

¹Where two or more separate departments, such as blast furnace department, openhearth department, foundry department, etc., are located at the same place and are operated by one establishment, each of these departments appears as a plant in the total figure. ²In addition 115,426 tons were reported consumed in direct eastings.



000 tons. Even excluding the home scrap—comprising largely recycled material—the tonnage of purchased scrap in 1935 still amounted to no less than 72 per cent of the iron content of the total iron ore consumed in blast furnaces, indicating the conservational aspects involved in the collection and use of scrap iron and steel.

Although information on consumption of these materials was not received from all consumers, the compilations include plants absorbing about 98 per cent of the total ferrous scrap and pig iron in uses which involve remelting of the scrap.

In this study the term "home" or "plant" scrap refers to scrap produced at the plant of the establishment reporting, including (1) new scrap such as spills, risers, skulls, croppings, mill scale, cinder, etc., and (2) old scrap (any items of equipment discarded after actual use). The term "purchased" scrap includes both purchased material and scrap transferred from other plants under the same corporate control, as well as scrap received under exchange contracts or conversion agreements. No doubt the largest proportion of home scrap consumed consists of recycled "new" material.

Scrap consumption centered in the great steel-making districts in Ohio, Pennsylvania, Indiana and Illinois. These states consumed, respectively, 24, 24, 11, and 9 per cent of the total home scrap; of the total purchased scrap they absorbed 23, 19, 10, and 9 per cent, respectively; and of the total pig iron they used 25, 26, 12, and 9 per cent, respectively. Thus, the two states of Ohio and Pennsylvania, producing some 53 per cent of the country's steel in 1935, consumed almost one-half of the total scrap and over one-half of the pig iron absorbed in that year.

The practice of increasing the proportion of purchased scrap in the total scrap and pig iron part of the charge in areas not enjoying easy access to pig iron supplies is shown by the fact that in the Southwestern district (Arkan-Oklahoma, Louisiana, and Texas) the percentage of purchased scrap to total scrap plus pig iron was 74 per cent; in the Pacific Coast district (Alaska, Oregon, Washington, and California) it was 59 per cent; and in New England (Connecticut, Maine, Massachu-Hampshire, Rhode setts. New Island, and Vermont) it was 51 per cent. In other districts, each including at least one important pig iron producing area, the percentages were markedly lower. In the Middle Atlantic district (Delaware, New Jersey, New York, and Pennsylvania) the proportion of purchased scrap in the total scrap plus pig iron part of the charge was lowest (24 per cent); the Southeastern district (south of the Ohio River and east of the Missispip) and North Central district (Lake and prairie states) were next (28 per cent each); followed by the Rocky Mountain district (31 per cent).

Judging from the number of operators reporting no pig iron consumption, it is not at all uncommon for furnaces of various types to operate all year on nothing but scrap, aside from fuel, fluxes, and frequently some ferroalloys. A total of 488 operators were in this category, comprising 385 cupola operations, 91 electric-steel, 6 air furnaces, 5 open-hearth furnaces, and 1 bessemer converter operation.

Consumption of ferrous scrap and pig iron in different types of furnaces is shown in the accompanying table and chart. Almost three-fourths of the total scrap consumption took place in openhearth furnaces; cupolas consumed about 16 per cent-a total in these two types of 88 per cent. The proportion of purchased scrap to total scrap plus pig consumption was highest in electric-steel furnaces, where it was 48 per cent; next in crucible furnaces (43 per cent); then in cupolas (33 per cent), open-hearth furnaces (29 per cent), air furnaces (23 per cent), and puddling furnaces (21 per cent). Finally, in bessemer converters it was almost negligible (0.17 per cent).

In submitting these results the Bureau of Mines seeks to fill a gap which has existed heretofore in metalliferous statistics due to the lack of adequate official figures on consumption of ferrous scrap on an annua! basis. This type of information is designed to meet the needs of: (1) Consumers of ferrous scrap, including operators of blast furnaces, steel mills, ferrous foundries, and rolling mills; (2) marketers of scrap iron and steel, including large brokers who sell, and dealers who collect, prepare, and sell the material; (3) large scrap producers; (4) producers of iron ore, with which scrap competes indirectly; and (5) other individuals and agencies interested in more general economic analysis, since the scrap market has repeatedly been cited as one of the most sensitive of all industrial barometers. In order to correlate ferrous scrap consumption more closely with pig iron consumption, figures for the latter were also obtained.

The bureau appreciates that its first efforts in this field may not meet all expectations, but it hopes to develop gradually through suggestions, advice and criticism from the industrial groups most interested, a type of analysis that will be in close accord with technical processes and best meet the needs of all groups vitally interested in supplies and use of ferrous scrap. Comment and suggestions from the trade regarding improvements

to be desired will be appreciated.

A more complete discussion of scrap iron and steel consumption in 1935, together with detailed figures, is given in Report of Investigations 3329 of the Bureau of Mines. Readers of The Iron Age may secure the detailed report by addressing a request to the Director, United States Bureau of Mines, Washington.

Mechanical Power Transmission Handbook

T is, perhaps, most fitting that this appreciation of William Staniar's excellent and practical treatise on mechanical power transmission should be made by THE IRON AGE, since it was in the pages of this publication that the gist of the material now appearing in the book first appeared, in a series of articles printed during 1933 and 1934 entitled "Choosing the Right Drive."

These articles, expanded to include a great deal of essential engineering information of the utmost usefulness to the industrial executive charged with the responsibility of efficiently utilizing power to drive the machinery of production, and brought up to date by the additions of new material descriptive of recent improvements in equipment design, form the backbone of the book. There is included also a great deal of hitherto unpublished material which tends to make the book wider in scope of treatment than the original articles.

This book is the first comprehensive treatment of the theory and application of the principles of industrial power transmission. It is a conscientious and thoroughly practical exposition of the subject from the point of view of the man who must design, install and maintain industrial power transmission equipment. Starting with a consideration of the character of prime mover available, and the engineering requirements of the various problems of power application and speeds, it traces the design elements to be considered, the manner of applying loads, the support of the transmission equipment, and the types of equipment now available for the purpose of transferring power from driving shaft to driven shaft.

The descriptions of equipment and the tables of engineering data pertaining to the application thereof to various transmission problems are very complete, and are presented in a form which will be found most useful by the plant engineer. The chapters are arranged in such a way as to make the book a handy reference volume. It will be a valuable addition to the working library of everyone charged with the responsibility of buying or selling industrial power transmission equipment, or of installing and maintaining such equipment.

If one criticism may be made of the book as a whole it is that the subject has been treated so much from the engineering point of view that the fundamental economic significance has been lost. Staniar sees so many trees that he cannot visualize the forest. The fundamental problem of industrial power transmission is to transfer power from a driving shaft to a driven shaft at the lowest possible cost consistent with the character of the work done in the shop. Mr. Staniar assumes this premise without discussion, then drives immediately at the technical aspects of equipment application. A couple of chapters covering the fundamental economic relations between the ultimate costs of power transmission and the costs of production would have made his handbook of much greater value to every reader. Nevertheless, in so far as it does go, the book is a vast improvement on the scattered and un-correlated material which to date has remained the only guide available on the subject to plant executives and to equipment salesmen alike.

FRANCIS JURASCHEK.

Corning Glass Works, Corning, N. Y., will acquire the Macbeth-Evans Glass Co., Charleroi, Pa., according to an announcement by officials of the two companies following ratification of the plan by the directors. No details as to the terms of the deal were given out, but it was said ratification by stockholders should be completed in time to permit operation on the new basis by Jan. 1, 1937.



Machinery & Tools Sales, Inc., 401 New Center Building, Detroit, has taken over the exclusive agency for the sale of Rahn-Larmon Co. lathes for the Detroit territory. The line consists of engine lathes and extension bed and removable block gap lathes from 16 in. to 50 in. swing in both the cone head and geared head types.

Stearns Magnetic Mfg. Co., Milwaukee, maker of magnetic separators, clutches, brakes and other magnetic equipment, has appointed S. O. Otrich Co., 119 New Montgomery Street, San Francisco, sales representative. The Stearns company has also opened a sales office in Philadelphia, and has placed James Whiting, with headquarters at 369 Architects Building, in charge. A 5 per cent bonus in the form of additional compensation for all its employees was recently announced by this company.

The permanent exhibition on the third floor of the International Building, Rockefeller Center, New York, will hereafter be known as the Metals and Plastics Bureau. Diversification of the displays which constantly show new developments in the metals industry and the plastics industry, has resulted in a sustained demand for a name to indicate the scope of its activities. Growth of the Metals and Plastics Bureau compelled the enlarging of its exhibition space. In addition to providing room for more exhibits, special quarters will be made available to exhibitors who wish to hold meetings or give demonstrations privately.

American Shear Knife Co., Homestead, Pa., has moved its Detroit office to 1010-1015 Stephenson Building. Frank C. Moyer is in charge.

Joseph Schonthal Co., Columbus, Ohio, has been absorbed by parent company, Summer & Co. Business will be carried on under same management, but under name of Summer & Co.

Rivet Cutting Gun Co. has moved office and plant to 309 West Third Street, Cincinnati.

Grasselli Chemical Co., Cleveland, has changed its name to E. I. du Pont de Nemours & Co., Inc., Grasselli Department, Wilmington, Del.

Dow Chemical Co., Midland, Mich., has opened a Chicago office at 135 South La-Salle Street. Wilson I. Doan, formerly manager of St. Louis office, is in charge, with K. M. Wildes as assistant.

Symington Co., Rochester, N. Y., has acquired capital stock of Gould Coupler Corp. and will henceforth operate as the Symington-Gould Corp.

Black & Decker Mfg. Co., Towson, Md., will grant Christmas bonuses of two weeks' extra pay to employees, Dec. 1. Lester Schwarz Corp. has moved main office to 41-28 37th Street, Long Island City, N. Y. Steel warehouses are located at 605-611 West 59th Street, New York, and 41-38 37th Street, Long Island City.

Cutler-Hammer, Inc., has announced that about \$225,000 will be paid on Dec. 10 in addition to wages and salaries to all employees other than those in the sales department at the Milwaukee plant and in the New York branch.

Bryant Machinery & Engineering Co., 400 West Madison Street, Chicago, general distributer for the Cleereman Machine Tool Co. of Green Bay, Wis., announces the appointment of the following exclusive agents to handle Cleereman drilling machines and tool room layout machines: J. F. Owens Machinery Co., 1020 State Tower Building, Syracuse; F. W. Schiefer Machinery Co., 404 Ellwanger & Barry Building, Rochester, N. Y.

Chapman Transmission Corp., Buffalo, manufacturer of anti-friction bearings and mountings, has appointed George P. Dempler Co., 3318 Latonia Avenue, Pittsburgh, as its representative in the Pittsburgh district.

Michigan Leather Packing Co., Detroit, is moving into new plant at 6301 East Lafayette Avenue. S. C. Leonard is president and S. C. Leonard, Jr., and L. Ford Merritt, are vice-presidents.

Rotor Air Tool Co., Cleveland, is moving Dec. 1 into larger quarters at 17325 Euclid Avenue.

Climax Molybdenum Co. of Michigan, Detroit, has moved its office and laboratory to 14410 Woodrow Wilson Avenue.

Newark Wire Cloth Co., Newark, N. J., has appointed Harry G. Mouat, Martin Building, Birmingham, as representative in that territory, and W. C. Myers & Co., 8 North Cheyenne Street, Tulsa, Okla., representative in the Tulsa territory. The Pittsburgh office has been discontinued.



Allegheny Steel Co., Brackenridge, Pa., has declared a 50c. dividend on the common stock. Regular quarterly dividend of \$1.75 on the preferred stock has also been Earnings for the third quarter declared. after all charges and estimated Federal and state income taxes, but before surtax on undistributed profits, were \$349,276, equivalent, after preferred dividends, to 39c. a share on the common stock outstanding. This compares with net earnings of \$246,-009 for the corresponding 1935 period, equivalent to 31c. a share. According to Harry E. Sheldon, president, expenses and adjustments involved in consolidating Allegheny's operations with those of Leechburg Steel Co., the merger of which was consummated during the period, affected the earnings for the 1936 quarter.

Scullin Steel Co., St. Louis, had a net operating profit in October of \$61,949 after allowing for selling expenses and depreciation, but before interest charges and Federal income taxes, as shown in report filed in Federal Court. This compared with operating profit of \$38,375 for September. Net sales for October were \$355,498, compared with \$319,772 in September. The report states that, as of Nov. 10, the company had not found it necessary to issue or sell any of the \$200,000 certificates authorized by the court to replenish the company's working capital.

Blaw-Knox Co. has declared a dividend of 35c. a share, payable Dec. 18. According to an official of the company, estimated earnings for the second half will exceed the amount reported for the first half when 51c. was earned. Incoming business was said to be satisfactory and prospects for increased bookings appear to be favorable. The present dividend makes a total of 80c., which will have been paid this year.

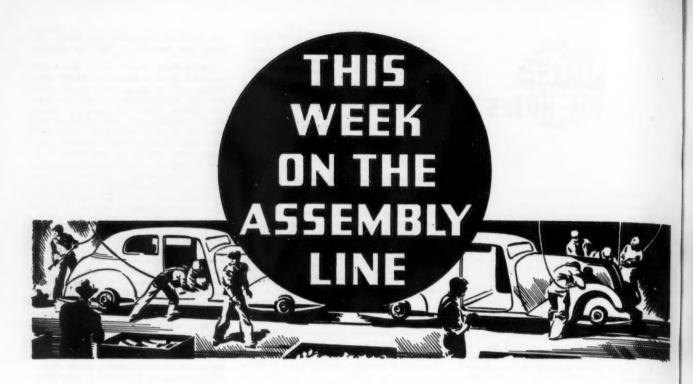
New Jersey Zinc Co. reports third quarter net income at \$1,253,813, or 64c. a capital share, against \$1,265,593, or 64c., in the preceding quarter and \$1,168,003, or 59c., in the September quarter last year. First nine months net amounted to \$3,593,585, equaling \$1.83 a share, compared with \$3,342,216, or \$1.70, in the corresponding months of 1935.

International Nickel Co. of Canada, Ltd., had third quarter net profit of \$9,572,106, equivalent after preferred dividends to 62c. a share on the common stock. This compares with net of \$9,070,186, or 59c. a share, in the preceding quarter. The nine months' net profit amounted to \$27,029,-080, equaling \$1.75 a common share, as against \$18,080,827, or \$1.14 a share, for the corresponding period of 1935.

Colorado Fuel & Iron Co. and subsidiaries in the quarter ended Sept. 30 earned net profit of \$338,658 after depreciation, depletion, Federal income taxes and bond interest, but before provision for undistributed profits tax. This was equal to 61c. a share on 552,650 no-par shares of capital stock. The earnings report was issued subject to year-end audit and adjustment.

Gulf States Steel Co. will pay all of its debentures on Dec. 1, the next retirement period, and retire all outstanding preferred stock on Jan. 2. This will require an outlay of more than \$7,000,000, and is in line with the new financing plan approved by stockholders at a special meeting Oct. 19. Gulf States Steel is issuing \$7,000,000 first mortgage sinking fund 4½ per cent bonds and additional authorized common stock in the amount of 98,569 shares.

National Supply Co. of Delaware, on advice of counsel, has withdrawn its recent capitalization plan. This step was taken since the company could not be certain of the validity of the plan, as presented, in view of a decision rendered recently by the Supreme Court of Delaware in the case of Keller et al. v. Wilson & Co., Inc., reversing the decision of the Chancellor. Previous to the withdrawal, National Supply Co. had received approval of almost 70 per cent of the preferred stock and 78 per cent of the common.



... Weekly production rises by 12,000 units as Ford Motor gets into full swing.

0 0 0

... Public gives enthusiastic reception to new cars and sales are running far ahead of last year.

0 0 0

. . . Labor difficulties at Bendix cause one plant to shut down for lack of brakes.

0 0 0

... United Automobile Workers are beginning to exert their strength in many directions, concentrating attack on company unions.

ETROIT, Nov. 24 .- With production zooming to new highs and plants reaching capacity to meet the unprecedented reception of the new cars at the various shows, there is only one dark cloud hanging over the automotive horizon at the present moment. That cloud might be labeled Situation." It heaviest over South Bend, Ind., but the fog has not yet cleared at Akron, and at other points throughout the country sporadic labor difficulties have been popping in the last week that would indicate a general restlessness on the part of

Practically all of the labor troubles that have broken out recently have been initiated by small groups and have not been a part of the labor strategy of either John Lewis' CIO or Homer Martin's United Automobile Workers. Nevertheless, when these difficulties have occurred, the national officers have stepped into the picture to make the most of the situation, whether created by their will or not.

The recent shutdown of the Fisher Body and Chevrolet assembly plant in Atlanta, Ga., is a typical example of the insignificant issues that sometimes provoke the new labor weapon of the "sitdown" strike and its concurrent retaliation by management of the "shut-out." Two workers at the Fisher plant insisted on displaying their union badges while at work. This was against a company rule made largely with the object of eliminating discussions during working hours as to whether one

should or should not join a union. Over this small issue there was a "sitdown" and a "shutdown."

Briggs Mfg. Co. had a small sitdown affair in Detroit over wage differentials. Its trouble was created primarily because of the bonus distributions made by the large automobile manufacturers. Briggs hadn't made one. This particular difficulty was confined to one sheet metal department and the settlement resulted in increases from 5c. to 20c. per hr. to bring up the wage scale more nearly in line with what other plants were The parts suppliers, inpaying. cluding body plants, have not in the past paid wages commensurate with the large corporation shops, but today that is not true and any existing differentials have been wiped out at Briggs.

Bendix Affair the Most Serious

The situation at Bendix is obviously the most serious of all and brings out a number of new tactics in labor warfare. Here the workers have not only sat down at their jobs, but have continued to remain in their work places, thus maintaining a state of siege at the plant. Food and blankets have been supplied by families and friends through the windows. This particular tactic is intended to illustrate dramatically one thesis of the organized labor movement, namely, that the worker has an inherent right to his job which even the company cannot take away from him. As one unionist put it, industry has what might be termed a "moral obligation" to



provide jobs, including the machinery and the place to work and cannot peremptorily remove a whole mass of workers from their jobs or, on the other hand, remove the job from the worker in a mass way.

Fundamentally, the trouble at Bendix is the one that has been fostering a series of sit-downs that have occurred in the rubber plants at Akron for the past six months. Basically, this is a situation where strongly organized national union is being combated by a minor company union which the national group feels is the tool of These organizers management. consider that the company is using the company union to "pros-elyte" workers and is using company time to carry on this campaign, whereas all recruiting activity on the part of the national union within the plant is barred. Fundamentally, therefore, the issue at stake at Bendix is the abolition of its company union. The UAW is demanding that Bendix cease and desist from badgering their members through this company union. Although it has been reported that the demand has been made for a completely closed shop to the extent that all non-union workers be discharged, this demand has not yet been directly presented, although in the final analysis the disbanding of the company union amounts to this.

Bendix had a trial of strength of the UAW in the early summer. The union succeeded at that time in getting the management to talk with their national officers, a point which had been refused earlier in the negotiations. The union also succeeded in having a wage increase promised when the new parts contracts for 1937 came through and as a matter of fact, a 5c. an hr. increase went into effect in September. One automobile plant was forced to shut down Monday because of lack of brakes. Ford Motor has doubled its brake orders at Kelsey-Hayes Wheel and is throwing some busines to Budd Wheel which this firm did not have before.

There has also been talk of Bendix moving its manufacturing facilities elsewhere, and it is understood that a number of sites have been tentatively selected. This was the move made by Chevrolet after its strike at the transmission plant in Toledo in 1935. Where in that year the Toledo plant had employed 2500 men, it now employs only 150, handling only service parts. Regular production has been split between plants at Muncie, Ind., and Saginaw, Mich. Ford is buying rubber machinery at the present time with the sole object of building up a source of tires within the company independent of Akron suppliers. Despite all efforts of union officials to quash sit-down strikes in that area, they still continue and many of these plants on their own initiative are building up production elsewhere so as to service their big original equipment customers.

Speaking of company unions and their conflict with outside organizations, the latest ruling of the National Labor Relations Board certainly shows a trend. In a recent decision handed down on the "industrial council" of the International Harvester Co., the point was made that employees of industry do not have the right to "bargain collectively through representatives of their own choosing" if their organization is aided in any way, even through the formation of an athletic association, by their employers. Companies in Detroit that avoided the use of the company union as a method of collective bargaining under the NRA are thanking their stars that they are free of such organizations, while one of the most prominent firms in the city that was so staunchly behind the so-called "works council" is now finding this device "a pain in the neck," to say the least. Perhaps the issue at Bendix will decide the fate of the so-called company union.

Also significant among labor trends is the move being made quietly by General Motors to adopt what amounts to a 40-hr. week. Time and a half will be paid for any hours worked over this amount, it is understood from reliable sources, although no official announcement has been made. This should furnish individual plant managers a real incentive to spread work, and is in keeping with the spirit of the NRA and industry's new cooperation with the President. Incidentally, this action is in line with one of the planks of the recently promulgated platform of the UAW, who will no doubt claim credit. During seasonal peaks of activity, it will



amount to a substantial increase in the weekly pay envelope.

Sales Double Those Year Ago

Meanwhile, sales of automobiles go on apace and the plants simply cannot turn out their product fast enough. At all the shows throughout the country, the reception by the public has been phenomenal and in several localities spot sales, double those of a year ago, have been reported. Buick retail sales are running 34 per cent ahead of last year's. Studebaker reports a 145 per cent increase for the first 10 days in November and 83 per cent for the year to date. Hudson sales are running 28 per cent above the corresponding week last year. Ford reports truck sales the largest in the company's history and also a tremendous interest in the new cars. As a result, Edsel Ford recently made the prediction that production for 1937 would be 50 per cent above 1936, or approximately 1,500,000 units.

Perhaps the most spectacular comeback on a percentage basis will be made by the Willys-Overland Co. With an attractively streamlined model designed by Amos Northrup, Murray Corp.'s chief body engineer, this car has attracted nation-wide attention. Even before the public showing, \$5,000,000 worth of dealer orders were reported. Production for No-

vember is scheduled at 1200 cars and for December at 5000.

Production of 116,125 passenger cars and trucks in the United States and Canada is estimated by Ward's Automotive Reports for the week ended Nov. 21. This represents a gain of almost 12,000 units over the week before and the largest output since May 16 of this vear. The principal gain came from Ford Motor, which stepped up its output from an estimated 18,225 units the week before to 26,925. General Motors divisions increased their volume by approximately 3000 units, while Chrysler divisions advanced from 26,000 to 26,650.

In sympathy with the rapid increase in production that has taken place, the index of industrial employment for Detroit has risen to 112.6, using the monthly average for 1923-25 for the base of 100. This is the highest index figure reached this year and is approximately equivalent to the peak point at the end of April, 1934. In that year, however, employment held to that level for only approximately a month, whereas this year, barring labor disturbances, should be maintained at a high level for 10 months with the possible exception of a seasonal lull in February, when car shipments are held down because of adverse weather conditions.

value of exports to England in all classifications save "presses, punching and shearing machines," in which Germany forges ahead.

Broken down into classifications, American exports of drilling machines to England in the first half of 1936 were 234 per cent greater than for the same period in 1935, as compared to a 95 per cent increase in German exports of that same product. In grinding machines sent to England, a 119 per cent increase was registered for this country, while Germany exports jumped 169 per cent. The value of the American exports for this year, however, was nearly six times that of Germany. Germany exceeded the United States in increase of lathe exports to England, 211 per cent against 183 per cent, the value of the American shipments again being much greater. American shipments of milling machines jumped 131 per cent, while German exports rose only 6 per cent. In planing and shaping machines, the value of American export to England decreased 156 per cent to a figure, which (although the German exports rose 99 per cent) was still nearly five times that of Germany, measured in value. Germany shot far ahead in exports of presses, punching and shearing machines to England, a 225 per cent increase being recorded, while this country's exports rose only 62 per cent. In this group, the value of the German export shipments was about three times that of the American total. In all other machine tools, American products were again in the fore, the value increasing 167 per cent against 45 per cent for Ger-

British Imports of Machine Tools Gain

PRITISH imports of machine tools were 91 per cent greater in value in the first half of 1936 than in the corresponding period of 1935, according to World Machinery News, a publication of the Department of Commerce, which states that American machine tool builders might have obtained a larger share of the British trade if they had used better sales methods.

The boom in the heavy industries in. Great Britain has created a large need for machine tools, which the British industry has been able to supply only in part.

Commenting on the lack of efficient selling methods by American manufacturers, the Government publication says:

"There appears to be a real need for more salesmanship, aggressive to the degree which is acceptable in that market, a more extensive use in the various industrial districts of sales engineers who would visit plants and factories, inspect equipment and production lines, and be competent enough to submit installation plans and reasonably accurate estimates as to the performance and advantages of the new equipment. Such sales engineers would supplement the existing selling and distributing agencies or representatives of American manufacturers, and should possess not only practical and technical ability, but a competent representative of this kind should become a very valuable asset to his employers, being readily available to customers or potential customers in his district for advice or installation plans. Such an established service prior to the current industrial upswing might have resulted in considerably more American equipment sales in that market."

In spite of the alleged shortcomings in sales for export on the part of American machine tool sellers, American producers are foremost in the list of those exporting to England. Principal competitors are Germany and Switzerland, but this country holds a substantial lead in

To Build Plant Addition

O meet increased demands for its Nitri-Cast-Iron, a special wear-resisting alloy, the Forging & Casting Corp., Ferndale, Mich, is constructing an extension, 100 x 60 ft., to its plant at 1101 Wanda Avenue. The addition will house a new Detroit rocking electric furnace, centrifugal casting machines for cylinder liners as well as heattreating furnaces, machine tools and other auxiliaries. The material finds use in sleeves of internal combustion engine cylinders, pump liners, valve bodies, valve seats and many other places where wear resistance is essential. The company is a division of the Ludlum Steel Co. Capacity will be raised to 5000 lb. of hot metal daily. The expansion will involve an expenditure of approximately \$45,000 for plant and equipment.

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available. Bold Face Type Indicates Changes This Week.

Raw Materials:	October,	September,	October, 1935	Ten Months, 1935	Ten Months, 1936
Lake ore consumption (gross tons)*	4,384,809	4,026,690 3,994,741	2,910,863 3,141,851	24,735,249 28,503,247	35,818,890
Pig Iron:					
Pig iron output-monthly (gross tons)	2,992,968	2,730,293	1,978,411	16,835,436	24,557,476
Pig iron output—daily (gross tons)	96,547	91,010	63,820	55,379	80,516
Castings:					
Malleable castings—Production (net tons)4		46,552	43,467	376,520	
Malleable castings—orders (net tons) ⁴		44,361	45,246	362,260	
Steel castings—production (net tons)4		76,617	42,597	325,030	
Steel castings—orders (net tons) ^a		56,877	34,553	326,914	
Steel Ingots:					20 150 205
Steel ingot production—monthly (gross tons)*	4,545,001	4,161,108	3,142,759	27,194,171	38,150,305
Steel ingot production—daily (gross tons)	168,333	160,043	116,398	104,593	146,170
Steel ingot production—per cent of capacity*	76.70	72.92	52.58	47.25	66.60
Finished Steel:					
Trackwork shipments (net tons)*	5,547	5,722	3,495	36,114	58,478
Steel rail orders (gross tons)e	119,237	25,800	38,742	363,299	804,065
Sheet steel sales (net tons)	223,195	255,557	226,209	1,981,070	2,089,492
Sheet steel production (net tons)*	235,057	213,706	222,963	1,991,675	2,143,528
Fabricated shape orders (net tons)*		112,594	102,708	880,675	
Fabricated shape shipments (net tons)*		137,008	98,444	924,256	
Fabricated plate orders (net tons)	22,135	34,302 18,755	30,530 31,865	203,615 277,840	297,500
Reinforcing bar awards (net tons)* U. S. Steel Corp. shipments (tons)*	1,007,417	961,803	686,741	6,027,964	8,875,124
Ohio River steel shipments (net tons)	145,065	95,705	104,659	776,170	930,446
Fabricated Products:					
Automobile production, U. S. and Canadak	229,989	*139,785	283,337	3,349,377	3,692,023
Construction contracts, 37 Eastern States ¹			\$200,595,700 \$		
Steel barrel shipments (number)d		787,380	884,888	5,696,681	
Steel barrel shipments (number) ^d		\$1,549,808	\$1,562,303	\$12,374,298	
Steel boiler orders (sq. ft.) ⁴ Locomotive orders (number) ^m Freight car orders (number) ^m		1,055,502	784,341	5,095,992	
Locomotive orders (number) m	22		0	28	180
Freight car orders (number)	1,310	3,100	810	8,103	38,658
Machine fool index	136.5	118.5	102.9	+102.9	1160.4
Foundry equipment index*	174.4	161.0	140.0	†127.1	+160.4
Foreign Trade:					
Total iron and steel imports (gross tons) P		59,993	59,569	358,824	
Imports of pig iron (gross tons)		15,080	17,168	99,098	
Imports of all rolled steel (gross tons)		28,618	24,444	176,762	
Total iron and steel exports (gross tons)		235,571 74,459	238,358 81,248	2,622,825 724,151	
Exports of all rolled steel (gross tons) ^P		86,040	63,954	620.507	
Exports of scrap (gross tons) P		152,314	145,850	1,797,468	
British Production:					
British pig iron production (gross tons)*	670,300	650,800	544,300	5,337,600	6,367,100
British steel ingot production (gross tons)*	1,060,500	1,027,000	907,300	8,127,600	9,678,500
Non-Ferrous Metals:					
	42,156	32,982	42,618	339,375	372,271
Lead shipments (net tons)"	59,210	50,685		348.088	411,016
Lead production (net tons)*	46,297	42,283	36,716	353,480	431,479
Zinc shipments (net tons)	54,035	51,847	47,033	375,486	446,345
Deliveries of tin (gross tons)*	6,005	6,200	5,355	49,715	61,730

†Three months' average. *Revised.

Source of figures: *Lake Superior Iron Ore Association; *Bureau of Mines; *The Iron Age; *Bureau of the Census; *American Iron and Steel Institute; *National Association of Flat-Rolled Steel Manufacturers; *American Institute of Steel Construction; *United States Steel Corp.; *United States Engineer, Pittsburgh; *When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of Census; *F. W. Dodge Corp.; **Railway Age; **National Machine Tool Builders Association; *Foundry Equipment Manufacturers Association; *Pepartment of Commerce; *British Iron and Steel Federation; *American Bureau of Metal Statistics; *American Zinc Institute, Inc.; *New York Commodities Exchange.



Weekly Index of Rate Activity in Capital Goods, Adjusted for Seasonal Variation, 1925-27 Average = 100

THE IRON AGE Weekly Index Numbers of Capital Goods Activity

(1925-27 Average = 100)

Last week	89.0	Same week 1933 47.1
Preceding week	88.6	Same week 1932
Same week last month		Same week 1931 50.8
Same week 1935	69.6	Same week 1930 72.5
Same week 1934	43.1	Same week 1929 103.4

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Individually there were some losses among the separate indices of the combined index last week. After seasonal adjustment, automotive production declined, though slightly. Construction eased fractionally, while steel mill activity was unchanged after allowing for seasonal movement. Railroad haulage of lumber showed a substantial gain, however, and heavy industry at Pittsburgh expanded operations.

So far as can be determined, the immediate outlook for business in these industries continues favorable.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Cram's Reports, Inc.; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from Engineering News-Record.

Offers Booklet on High-Strength Metals

A SYMPOSIUM on high-strength constructional metals, made up of five extensive technical papers and discussion presented at the 1936 regional meeting of the American Society for Testing Materials is now being offered in

pamphlet form. The papers cover the chemical and physical properties and manufacturing and fabricating properties of metals and alloys applied for various constructional applications including buildings, ships, automobile bodies, airplane wings, tanks, etc.

The papers give the latest information and data on the following: carbon and low-alloy steels, corrosion-resisting steels, alloys of copper, alloys of nickel, and alloys of aluminum and magnesium. There are a great many charts and tables of data in the symposium, thus presenting a great mass of valuable and extensive information in condensed form.

Copies of the 126-page publication can be obtained from A.S.T.M. headquarters, 260 South Broad Street, Philadelphia, for \$1.25.

WASHINGTON



By L. W. MOFFETT Resident Washington Editor, The Iron Age

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- ... Business and industry taking steps to cooperate actively with the Government in the solution of relief and other problems.
- ... One of the most difficult subjects is the absorption of additional workers by industry, which President Roosevelt has urged.
- ... Chamber of Commerce of United States recommends a policy of gradually discontinuing Federal work relief.

ASHINGTON, Nov. 24.—Great cross sections of industry have recorded or are about to make known their attitude toward social and economic problems which confront the nation. Reflecting a spirit of cooperation with the Government, industry's principles will be available to the Roosevelt administration prior to the convening of the seventy-fifth Congress for consideration with respect to a legislative program where proposed legislation is entailed.

Outstanding among activities of business regarding these problems are:

Celebrations at dinners in Washington and 10 other cities yesterday marking the hundredth anniversary of the American patent system. These celebrations were participated in by thousands of Government workers, industrialists, scientists and other prominent public figures, and President C. M. Chester of the National Association of Manufacturers has said they would usher in "an era of good feeling between industry and Government."

Directors of the Chamber of Commerce of the United States last Friday in Washington presented reports concerning national problems, and among other suggestions urged adoption of a policy gradually discontinuing work relief.

Business Advisory Council at meeting last Thursday with Secretary of Commerce Roper accepted responsibility of cooperation with the Government in the solution of problems, including that of unemployment, in response to letter from President Roosevelt.

Congress of American Industry will hold its annual meeting at the Waldorf-Astoria Hotel, New York, Dec. 9 and 10. Keynote speakers will be Mr. Chester, who is chairman of the General Foods Corp.; E. T. Weir, chairman of the National Steel Corp., and Lewis H. Brown, president of the Johns-Manville Corp.

Preceding the Congress of American Industry, the National Industrial Council will meet Dec. 7 and 8 at the Waldorf-Astoria with a nation-wide representation of State and local manufacturers' associations and National manufacturing trade associations.

Many Subjects Considered

Subjects considered and being considered include social security, Government finance, unemployment, taxes, tariff, child labor, Government competition and other broad subjects of public importance.

The first get-together meeting between industrialists and Government representatives since the Presidential election was that of the Advisory Council. Among other members of the council who were in attendance were Myron C. Taylor, chairman, United States Steel Corp., New York; Charles R. Hook, president, American Rolling Mill Co., Middletown, Ohio; Ralph

E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt.; Gana Dunn, J. G. White Engineering Co., New York; Rolland J. Hamilton, American Radiator Co., New York; Fred I. Kent, National Industrial Conference Board, New York; Morris E. Leeds, Leeds & Northrup Co., Philadelphia; Thomas J. Watson, International Business Machines Corp., New York, and Samuel P. Wetherill, Wetherill Engineering Co., Philadelphia.

The President in a letter dated Nov. 16 to Secretary Roper suggested that the Advisory Council make a study of three outstanding social and economic problems as follows:

The problem of further absorption of workers by private industry.

The problem of improving living conditions of low-income groups through low-cost housing and slum clearance.

The problem of improving wages and working conditions of employees in industry.

In a letter to Secretary Roper, George H. Mead, chairman of the council, pledged full cooperation of the council in seeking the objectives set forth by the President. The executive committee of the council will meet in New York on Dec. 16 and formulate a program. The full council, together with former members who have been rotated off, will hold a dinner

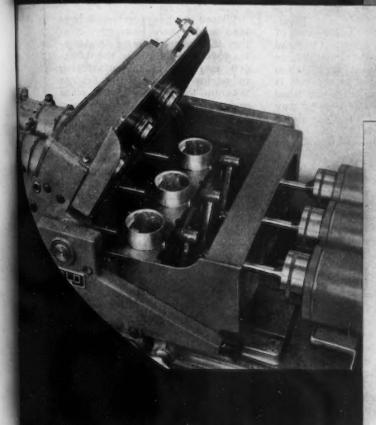
PERFECT FINISHING OF THE BORES

3 COMPONENT PARTS with HEald



в. Connecting Rods

- A. Cylinders
- c. Pistons



- A. The Heald No. 45 Bore-Matic finish bores all holes simultaneously in various size cylinder blocks up to straight eights. It assures absolute parallelism of bores, perfect squareness of bores to crankshaft bearing holes, with a roundness and straightness to .0002" tolerance. Block can be readily transferred from conveyor to table where it is automatically carried up into the fixture, located and held from the crank shaft holes.
- B. Heald No. 49 Bore-Matic precision boring both the bronze wrist pin and steel crankshaft holes in three connecting rods simultaneously. This arrangement provides perfect parallelism between holes, eliminating any straightening operation.
- C. Heald No. 49 Bore-Matic rough and finish boring wrist pin holes in three pistons simultaneously with one cycle of the machine. This method assures squareness with outside diameter and perfect alignment to a tolerance of .0001".

THE HEALD MACHINE CO., WORCESTER, MASS., U. S. A.



meeting in Washington on the evening of Jan. 27 and a business session will be held the following day.

Absorption of Relief Workers

In addressing the council, Secretary Roper emphasized that one of the most obstinate problems demanding attention on the part of business is that of "further absorption of workers by private industry." Recommendations looking to solution of the problem are awaited with great interest. Basic industries generally, including iron and steel, are today employing more workers than were employed in the peak production year of 1929 and for this reason absorption of more workers in such industries is a difficult problem. The view of organized labor looks to further shortening of hours, which many industrialists contend would defeat the purpose sought because it would inevitably result in higher prices and curtailed consumption.

It is expected that the suggestion of shorter hours will share in proposals that Major George L. Berry hopes will be brought out in a prospective industrial regimentation program at the meeting of his Council for Industrial Progress to be held Dec. 10 and 11 in Washington. There has been speculation as to whether the program taken up by the Advisory Council will offset entirely or in part at least the Berry program, which many industrial leaders do not favor. Berry is being criticised because of both his political activities as head of Labor's Non-Partisan League and as a prominent organization labor official who, it is charged, is trying to shove an organized labor program through Congress by way of the meeting of the Council for Industrial Progress, which heads as the administration's coordinator for industry. Predictions are being made that Berry's forthcoming conference will see a slim attendance. His conference of last year broke up in a row resulting in a wholesale walkout of industrialists. Nevertheless, Berry is officially the administration's coordinator for industry and is thoroughly in the good graces of the White House.

Mr. Berry's ideas of a new NRA, of the Supreme Court "adjusting itself to the mandate of the people," the Major's self-conceived idea of what the "mandate" is, are far from ideas that may be expected from Secretary Roper and his Advisory Council. In expressing these ideas, as he has emphasized at the Tampa, Fla., meeting of the American Federation of Labor, Berry said he was not speaking for the administration. Manifestly he was not, as Secretary of Labor Perkins, also addressing the convention, ex-

pressed views on labor legislation that did not accord with Berry's views. Miss Perkins emphasized the need of State cooperation for better legislative protection. Berry wants the Federal Government to control entirely and is in favor of a constitutional amendment to that end, if it cannot be achieved otherwise. Despite the fact that Berry was not speaking for the administration, however, his position as coordinator for industry, his activities on behalf of the President for reelection, and the growing de-mands being made by organized labor for Federal legislation in its sole interest, give weight to his expressions.

Skilled Workers First to Be Reemployed

In connection with the suggestion of President Roosevelt that industry do everything possible to reemploy workers above 40 years of age, President Chester of the National Association of Manufacturers said he was confident that industry will agree with the suggestion.

"It is true, as the President states, that skilled workers have been the first to find their way back to private employment," said Mr. Chester. "Reports from many trades, industries and communities, already show a shortage of skilled workers.

"Based upon surveys which have been made, there is every indication that unemployment in America today is well below the 5,000,000 mark. The manufacturing industries have been the first to take up the unemployment slack and employment in these industries today is above 90 per cent of the 1929 level. It is increasing all the time.

"The National Association of Manufacturers is now making a survey of its membership in connection with its Congress of American Industry to be held Dec. 9 and 10, and from this we hope to develop additional information on manufacturing employment.

"Personally I know of no studied policy on the part of industry not to employ men above 40 years of age. As for the unskilled, the National Association of Manufacturers have for some time been urging additional apprenticeship training by industries and by educational institutions to overcome this shortage of skilled workers.

"Employment within private enterprise can be the only American answer to unemployment. I am hopeful that employment in trade, distribution, mining and farming, as well as in manufacturing, soon will meet every demand of those

in this country who desire to work."

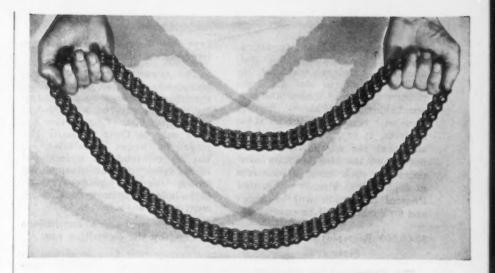
Mr. Chester has expressed confidence that from this Congress of Industry, meeting in New York almost simultaneously with the meeting of Berry's Council in Washington, will come "one of the most progressive and constructive statements of principles ever to be adopted by American business men."

The Business Advisory Council adopted a resolution urging all employers throughout the country to cooperate wholeheartedly with the Social Security Board and the Postoffice in the board's program for assigning old-age benefit account numbers to some 3,500,000 employers and 26,000,000 employees. In making public the resolution of the Business Advisory Council, Chairman John G. Winant of the Social Security Board said that not only have numbers of employers already completed the return of their own forms but in many communities the employee application forms have been delivered and are pouring back into the post offices with the information requested.

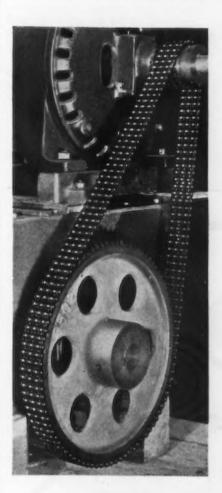
Chamber of Commerce of U. S. Urges Gradual Discontinuance of WPA

ASHINGTON, Nov. 24.— Headed by John W. O'Leary of Chicago, president of the Machinery and Allied Products Institute, the special Committee on Employment of the Chamber of Commerce of the United States has urged a policy of gradually discontinuing Federal work relief. The recommendation was made by the committee in a 20-page report submitted to the chamber board at its meeting here last Friday. The report, with its recommendations, was the final draft of a preliminary report, the outline of which was published in THE IRON AGE. It offers suggestions for the absorption by private industry of unemployed workers, emphasizing as a means in this direction vocational training.

Another report submitted to the chamber board recommends the widest possible study of the State compact method as a means for utilizing State legislative powers. It is in striking contrast to suggestions and even "demands" that are growing among both Federal Government representatives and organized labor groups for national legislative control of industrial and agricultural activities. Possible subjects for State compacts mentioned by the chamber



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committee include labor legislation, electric utility regulation, milk production and natural resources, including bituminous coal and competitive fuels and timber and corporate charters. Whatever may be done with respect to some of these subjects, it is a foregone conclusion that the administration will not accept the idea of State compacts for such natural resources as coal. It has already announced Federal legislation will be urged and no doubt it will be enacted.

8,500,000 Reemployed in Business Since 1933

The Committee on Employment recommends that business continue its efforts to reemploy as many as possible from the lists of unemployed. It estimates the number of persons reemployed in business and industry since the depths of the depression (March, 1933) at 8,500,000. It was stated that at least 3,000,000 of these have been put back to work since May, 1935. It was in May, 1935, that the Supreme Court held NRA to be unconstitutional, but the committee report makes no mention of the fact.

The report at considerable length tells how the various and conflicting estimates on unemployment from different sources were reached and cites reasons which it says show they are unsatisfactory, impracticable and inaccurate.

The present number of unemployed who, if employed, would find their places in business and industry, is placed by the committee at under 4,000,000. This number applies only to those normally employed on wages or salaries. It has no reference to unemployed farm labor or the unemployed among the professional classes. It includes those now on Government relief work.

Among general conclusions reached by the committee are:

"Employment is a local matter, with many local variations, seasonal and otherwise.

"Projects of work relief should not be allowed to take the place in any degree of established agencies for performance of Government functions.

"Projects of work relief should not be permitted to compete in any degree with private enterprise for workers, skilled or unskilled, and should be so conducted as to encourage workers to seek private employment.

"It is evident that further advance in business activities will require the services in private enterprise of persons now on work relief at public expense.

"There should be immediate expansion of facilities in the States

and communities for young people, and for workers desiring to increase their skill, to obtain training that will fit them for employment through which they can advance their standards of living in accordance with their own capacities."

Very Little Unemployment Among Skilled Workers

The report says that in each analysis which has proved possible and in the reports received from organization members of the chamber, the relatively small national figure for unemployment among skilled workers has become evident. It is added that reports also make it clear that there is already a shortage of skilled labor in many sections and in several industries. In the same analyses, the preponderance of unskilled workers among employable persons on Federal work relief, the report says, is equally apparent. Because of the reports received, the committee renewed the recommendations of its preliminary study and urges immediate and earnest consideration for further activities which have for their goal both the training of older workers for skilled and semi-skilled classifications and the preparation of new workers for skilled occupations.

"The time has come for renewed, vigorous attention to proper training for occupations in private employment to meet the need for skilled workers which will become more and more urgent under normal advances in economic conditions," the report said in its discussion of vocational training.

Examination of the evidence, it is stated, soon demonstrates that nationally there is little or no unemployment in agriculture, outside of drought areas. Further, it is declared, so far as the available index number can be used as guides, it would appear that unemployment in those fields outside manufacturing is proportionately larger than in manufacturing. Of all persons with gainful occupations outside agriculture, about 71 per cent in 1930 had occupations elsewhere than in manufacturing, it is stated. Respecting the extent of unemployment in some of the fields making up this 71 per cent, the index numbers ordinarily used in making estimates are declared to be much more inadequate than in the case of manufacturing.

The report says it would seem obvious that to those fields outside manufacturing belong more than 3,000,000 unemployed persons



available for hire in private enterprise in the total estimate of unemployed, above and less than 1,000,000 are assignable to manufacturing industries.

Steel Industry Reemployment Understated, Report Says

"Even these estimates do not make sufficient allowance for the undoubted fact that every index number understates actual employment in its field," the report points out. "That this is the case has recently been demonstrated graphically with reference to employment of wage earners in steel mills. Using the average for 1929 as 100, the index for June, 1936, was announced as 80.6, which, if used as a percentage, would mean employment by 82,000 less than in 1929; on Aug. 18, the American Iron and Steel Institute reported that in June wage earners in steel mills, at 451,000, were 9 per cent higher than the average in 1929.

"The estimates of unemployment which have been reached above should be considered as maximum figures well beyond the facts. They are calculated upon an assumption that 100 per cent of employment could now be attained and maintained on a nation-wide basis. Nothing approaching such employment has ever been reached or can be expected, because of the reasons for voluntary unemployment to which attention has already been called." Reference to voluntary unemployment covered those leave employment from their own choice and without precaution of first finding elsewhere employment more to their liking, or who have left employment for other personal reasons.

Influences adverse to reemployment are appearing in some of the States, the committee finds, by reason of legislation which, however well intended, operates to bar from reemployment persons who are eager to accept places that are open, or who may be highly skilled. The report says there is an example in the extent to which workmen's compensation laws and their administration, particularly with reference to occupational diseases. have been carried in some States. Many employers, it is stated, are made to feel that they have no alternative but to reject applicants with physical defects which might have no influence upon their efficiency as workmen.

Urges Support of Government

In a radio broadcast last Friday night, Harper Sibley, president of the Chamber, having in mind the matter of cooperation between business and the Government, said that the attitude of the chamber is "that the Government is entitled to the support and cooperation of the citizenship" and added that the rule is universal.

"It also works both ways," said Mr. Sibley. "The Government is entitled to the expression of honest criticism, based upon fact and experience, regarding any steps that it may take. Business is likewise entitled to consideration on the part of the Government."

Mr. Sibley further said that business is as much interested as the Government itself in solution of problems standing in the way of national progress.

"Steady employment, high wages and general prosperity are as advantageous to it as to any class or group," Mr. Sibley declared.



Metal Window Trade Denies Price Fixing

ASHINGTON, Nov. 24.—Denial of charges of price fixing made by the Federal Trade Commission in a recent complaint against the Metal Window Institute has been made by Ralph H. Sator, commissioner of the institute. In a statement issued last Friday, Mr. Sartor declared that trade practices attacked by the commission were "terminated after NRA was invalidated by the Supreme Court." Replying to the commission's claim that the metal window industry, through the institute, had artificially increased prices, Mr. Sator said

the charge was "contradicted by the fact that the price of metal windows has steadily declined over a period of 10 years, such decline being halted only to the extent made necessary by increased wages and increased cost of raw materials resulting from our code and the codes of the supplying industries."

Mr. Sator said that "a formal answer will be filed refuting all charges."

Meanwhile, Attorney General Cummings has stated that he expects a report will be ready soon regarding investigation by the Department of Justice as to alleged collusive bidding by steel manufacturers in connection with Government contracts.





W. P. SIEBERT

WILLIAM PAUL SIEBERT, prominent retired steel man, died Nov. 18 at his home in Sewickley, Pa. Mr. Siebert was born in Pittsburgh on June 9, 1859. He began his busi-

Machinery Companies Take on Apprentices

SHORTAGE of skilled labor is a normal development, rather than an alarming new problem now before American industry, John W. O'Leary, president of the Machinery Institute, declared.

"We face this shortage of men with specialized skills after every depression," he said, "and the need of finding suitable men to train for skilled jobs is constantly with us as long as business is normal. Those who deny that any shortage of skilled labor exists, and also those who complain that the shortage is impeding business operations fail to recognize the happy circumstance and the opportunities it brings for full employment. This is a normal and welcome development."

Mr. O'Leary said that machinery manufacturers have taken on hundreds of apprentices in the last few months to train them for skilled jobs now available and for the jobs which will become increasingly numerous as the activity of capital goods manufacturers continues.

ness career in 1887 with the Pennsylvania Railroad. He also worked for the Conway-Torley Co. and the Park Steel Co. He was general manager of sales, Ohio Steel Co., which became the National Steel Co. in 1898 and which in 1901 was combined with the Carnegie Steel Co. Mr. Siebert was assistant general manager of sales, Carnegie Steel Co., until his retirement on April 30, 1931.

. . .

LEVIN FAUST, an industrial leader of Rockford, Ill., died on Nov. 18, aged 73 years. He was among the founders of the Mechanics Universal Joint Co., the Rockford Drop Forge Co., Forgings & Stampings, the Rockford Machine Tool Co., the National Lock Co., the Sundstrand Adding Machine Co., the Sundstrand Machine Tool Co., and the Sundstrand Engineering Co. He was president of the Elco Tool & Screw Co., vice-president of the Rockford Drop Forge Co., trea-surer of Forgings & Stampings, vice-president of the Sundstrand Machine Tool Co., and president of Karlson's Klister Mfg. Co. Mr. Faust had served as a Rockford Park Commissioner since organization of the first board in 1909. He had served as president of the board from 1911 through 1920.

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Japan Plans to Increase Ore Supply

TOKIO, Japan (Special Correspondence). The Nihon Seitetsu, Ltd., Japan's largest iron producing concern, plans to obtain a substantially larger amount of iron ores by means of developing the industry, not only in Japan, but also in the South Seas region, including Australia.

In view of the increasing shortage of pig iron supply, the company has been working on a plan to increase the annual production by 4,700,000 tons. It has so far mapped out the project of increasing the output by 3,300,000 tons, and is at present studying ways and means of turning out the additional 1,400,000 tons. It is scheduled that these plans will be materialized some time during 1941.

In and after 1941, therefore, the company will require from 8,000,000 to 10,000,000 tons of iron ore. At present Nihon Seitetsu obtains approximately 4,300,000 tons of iron ore supply in the following ratio: 1,000,000 tons from Japan proper and Korea, 2,000,000 tons from Malay Peninsula and the Philippine Islands, 1,000,000 tons from China and 300,000 tons from Australia.

The domestic supply, therefore, is only about a quarter of the total requirement. In the proposed schedule, however, the domestic supply is to be increased to about 3,000,000 tons, so that its percentage may be increased to about one-third.

Production of iron and steel in Japan proper, Korea and Manchuria for the first eight months of this year follows, according to the Ministry of Commerce and Industry:

(In Metric Tons)

(_	
Pig Iron:		Gains Over Year Before
Japan and Korea		
Manchukuo	429,170	31,568
Bar Steel:		
Japan and Korea	3,212,364	285,556
Manchukuo	224,493	168,353
Carbon Steel (Ingot and Casting):		
Japan and Korea	73,726	8,150
Carbon Steel		
(Market Billets) Japan and Korea		16,061
Manchukuo	48,324	31,229
Carbon Steel (Sheet Bars):		
Japan and Korea	233,360	9,055
Manchukuo	46,992	43,617
Cast Steel:		
Japan and Korea	46,795	7,357
Rolled Steel:		
Japan and Korea	2;695,328	350,584
Manchukuo	83,541	79,626



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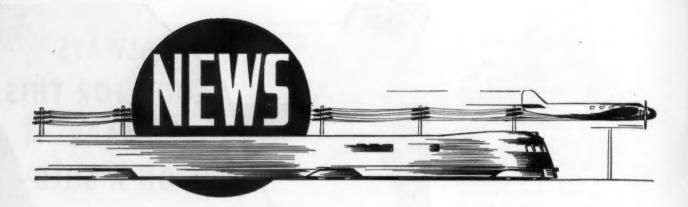
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Youngstown Sheet & Tube Co. to Spend \$10,000,000 for Improvements

PROGRAM of plant improvements and betterments, designed to increase and improve the company's finishing capacity and efficiency of operations, has been announced by the Youngstown Sheet & Tube Co. This includes installation of new equipment, and improvement of existing equipment, in the company's plants in both Youngstown and Indiana Harbor, and will involve an expenditure of approximately \$10,000,000.

In the company's Campbell plant in Youngstown another four-high continuous cold mill will be added to present cold rolling facilities, increasing cold rolling capacity by about 15,000 tons a month. Contract for this mill has already been awarded to the Mesta Machine Co., Pittsburgh. Additional normalizing, annealing, pickling, and other equipment for rounding out finishing facilities will also be included.

The new cold mill reflects the increasing demand for cold rolled sheets for automotive and other purposes, and completes the company's program of rehabilitation of its strip and sheet-producing facilities begun with the building of its continuous hot strip mill two years ago. It is expected that the new

cold mill will be completed early next fall.

A reversing mill for rolling of rounds will be installed at the company's Brier Hill plant in Youngstown, to improve the company's pipe-making facilities. This mill, which will have a capacity of 35,000 tons a month and will produce rounds up to 14 in. in diameter, will supplant existing facilities for rolling rounds at the company's Campbell plant, where the sizes and tonnages were restricted to a limited range.

Other improvements include rehabilitation of finishing facilities of the seamless tube plant, including new upsetting and threading equipment, at the Campbell plant, and completion of the company's coldrolled tin mill and other projects now under way at Indiana Harbor.

Three new buildings are included in the program. The new cold mill will be housed in a building 120 x 900 ft. New buildings will also house the seamless mill improvements at Campbell and the new round mill at Brier Hill.

"Present plans are a continuation of the company's broad program of plant modernization announced and begun two and a half years ago," Frank Purnell, president of the company, said. "Improvements now contemplated will still further improve the company's position as to markets, and assure broader and more stable outlets for the company's steel-making capacity."

Floating Drydock to Cost \$15,000,000

DIDS were opened Wednesday and details released for the first time by the Navy Department on the floating drydock for use at Pearl Harbor, T. H., which will require about 30,000 tons of steel and will cost \$15,000,000.

Supposedly made necessary by the development of the aircraft carrier, the dock will be of steel with a length of 1016 ft., a beam of 165 ft. and a height from top deck to keel of 75 ft. Equipped with steering mechanism and a stern gate, which can be raised or lowered, the structure will be in one piece and will have a pointed bow. Displacement is estimated at about 45,000 tons and it is designed to accommodate any existing United States naval ship up to and including the airplane carriers Lexington and Saratoga with drafts of 45 ft.

The most significant feature of this project is the bow and steer-

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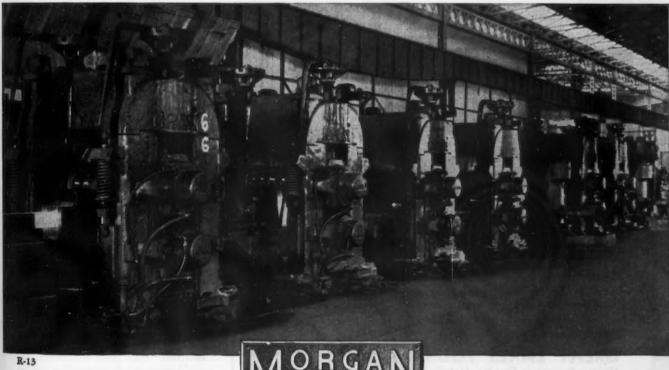
For this coin of a hundred million pockets is the key to vast markets. As the price anyone can afford, it demands recognition. And only through modern mechanized processes can its purchasing power be maintained.

The steel industry offers dramatic proof of this value. Fly swatters, screw drivers, tea strainers, button hooks . . . it daily produces tonnage—and profits—for an army of fabricators. But costs must be figured in fractions.

As raw material and labor advance, speed must

increase, quality improve. This condition is beginning to make itself felt at the rolling mill, in demand for greater accuracy, better quality and finish in rod, strip and merchant shapes. And the mill equipped to meet these requirements profitably will find dependable, increasing tonnage.

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THE IRON AGE, November 26, 1936-67



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ing equipment. It is also unique, however, in that it can be towed at 10 knots per hr., something which is said never to have been accomplished before in any other navy in the world.

A small dock of the same design is already in commission in the Navy and has been used for experimentation, while bids for a second dock, 446 ft. long with a beam of 68 ft., have already been asked. The two smaller structures will be able to service submarines and destroyers, while the one now under construction will take care of battleships, aircraft carriers and cruisers. Theoretically the three together will compose a service squadron able to make all necessary emergency repairs in wartime.

The only floating drydock com-

parable in size is located at England's Singapore naval base, but it is not towable. Experts construe the mobility of these structures as an indication that in the future the Navy will seek to obtain greater freedom from fixed bases.

Foreign Industrial Activity at New High

THE world economic situation showed further improvement on the whole during September and October, according to the monthly review of foreign economic conditions by Winthrop W. Case in The Annalist (New York) of Nov. 20. Industrial expansion continued, foreign production attaining a new alltime record. International trade made further moderate gains. Commodity prices were definitely unsettled, reflecting the disturbing influence of the French devaluation, although they stood up well, all things considered.

The steady expansion of world industry continued during September. Industry in the leading countries of the world outside of Russia operated at about 106.2 per cent (preliminary) of the 1929 average in September, according to The Annalist's index, as against 105.3 in August, and 104.7 in July. If the United States, where recovery has been relatively laggard, be also excluded, the September index of 113.1 exceeded even the highest month in 1929—111.5 in August of that year.

Practically every country shared in the latest upturn. Industry was reported as more active in the United States, Canada, France, the Netherlands, Austria, Czechoslovakia, Poland, Sweden, Finland, Norway, Chile and Japan. The British index was unchanged, although the current upward trend appears unbroken. The German index declined slightly. The minor recovery of the French index largely reflected the end of the paid vacations under the new social legislation which had curtailed output in August.

Purchasing Agents' Association of Chicago held a two-day show, Nov. 20 and 21, at which 131 exhibitors participated. A novel exhibit which attracted particular attention was that of Erman Howell & Co., brokers of scrap iron and steel, consisting of a full-size model of a section of a gondola loaded with turnings. There were also exhibited numerous samples of both good and bad scrap from which visitors could learn much concerning the requirements and desires of scrap consumers.



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Galvanizers Form New Organization

A NEW permanent organization, the "Galvanizers Committee," definitely allying technical groups in the steel and zinc industries, is the result of a meeting held in Pittsburgh last week at which representatives of over 20 companies were present.

This two-day meeting, which had its origin among sheet galvanizers who attended the technical sessions of the American Zinc Institute at St. Louis last April, was attended by executives, technicians and operating men from the galvanizing departments of sheet steel producers. Problems in sheet production occupied the early sessions; the final session was given over to a discussion of ways and means of continuing the meetings under a permanent arrangement.

The close relationship of the galvanizing departments to the zinc industry led to the adoption of a plan whereby the Zinc Institute assumes the sponsorship of the new organization, the president and secretary of the institute to be exofficio members. The affairs of the group will be administered by a council consisting of one individual from each company represented in the membership, and a governing board of seven chosen from the council. Two meetings will be held each year, one in conjunction with the annual meeting of the Zinc Institute in April, the other in the fall at some place to be determined.

Japan Is Scouring The World for Scrap

ARGE imports of scrap into Japan during July were commented on in a recent consular report to the United States Government. The report states that the July receipts temporarily alleviated the shortage of scrap in Japan at that time, but that current stocks are once again abnormally small. Efforts are being made to locate sources of supply other than the United States because of high American quotations.

Various reports from different parts of Java, Netherland India, indicate that Japanese agents have had some success in these regions and are purchasing scrap on a considerably higher scale than previously. Remote villages in which scrap iron buyers have never before conducted business are now being scoured for supplies, it is stated. Exports of scrap from

Java during the first seven months this year totaled 33,623 metric tons as against 24,159 tons in the corresponding 1935 period.

Japan also has been active in South Africa, and a report states that a shipment of 7000 tons of scrap for Japanese interests was recently loaded at ports in the Union of South Africa.

Construction of a continuous strip mill of 300,000 metric tons' annual capacity by the Kobe Steel Works of Japan was to have begun during October, but under different plans the unit is not expected to be completed before the close of 1937. A similar mill which the Japan Steel Co. contemplates building will approach completion at about this time also. Together these will be the first continuous strip mills ever to be erected in Japan.

Experiments in producing pig iron by the so-called "direct meth-



od" (eliminating the smelting furnace) have been made in Japan at various times, according to additional information supplied the U. S. Government. While experiments have not yet progressed beyond the laboratory stage, successful solution of the problem is said to be "only a matter of time." The Japanese steel company making this claim is understood to have contracted for the purchase of about 300,000 tons of iron ore for use in its experiments.



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10401 NORTHLAWN AVE., DETROIT, MICH.



WILLIAM E. CROCOMBE, president of the American Manganese Steel Co., Chicago, division of the American Brake Shoe & Foundry Co., has been elected vice-president of the Brake Shoe company. He started in the steel industry as an office boy with the old Minnesota Iron Co. He later went to work in the rail and open-hearth departments of the Illinois Steel Co., where he remained until 1907. For the next two years he was identified with the Lackawanna Steel Co. and until 1915 was with the Union Drop Forge Co., Chicago. Mr. Crocombe organized the forge department of the Ajax Forge Co., now the American Forge division of the American Brake Shoe & Foundry Co. He was made president of the American Forge Co. in 1924 and of the American Manganese Steel Co. in 1933.



MARTIN L. HOPKINS, who has been identified since 1890 with the Republic Steel Corp. and its predecessor companies, has been made assistant manager of sales of the bolt and nut division of the Republic Steel Corp., Cleveland. FRANK P. McEwen will continue as the other assistant in this division. Mr. Hopkins became associated with the Union Rolling Mill Co. in 1890, and was its secretary when it was merged with the Upson Nut Co. and Bourne-Fuller Co. in 1920. He

was later elected secretary of the combined companies and retained that title until the formation of the Republic Steel Corp. in 1930.



ERNEST A. BARBEAU has been appointed sales manager of the Hypressure Jenny Division, Home-stead Valve Mfg. Co., Coraopolis, Pa. Mr. Barbeau takes up his duties after serving for three years as industrial sales manager for the Texas Co. in New York. Previously he was head of E. A. Barbeau & Co., Schenectady, N. Y., invest-ment security dealers and brokers, and previous to that he was sales engineer for the General Electric Co. for 10 years, at various times having headquarters at Chicago, Schenectady, Cleveland, Akron and Minneapolis, devoting his chief efforts to the sale of heavy power and industrial equipment. Barbeau is a graduate of the University of Chicago with the degree of electrical engineer.



JOHN L. YOUNG has been appointed manager of machinery sales for the United Engineering & Foundry Co., Pittsburgh. Mr. Young joined United on Feb. 1, and has been associated with the sales department as service engineer. Previous to joining United, he was associated with the Timken Roller Bearing Co., Canton, Ohio, for 14 years, having joined that company in 1921 to specialize in the application of Timken bearings for mine cars. This took Mr. Young to the Pittsburgh district, where he served for a number of years as district manager and for the year preceding his transfer to United, he was assistant general manager of the industrial division at Can-







M. L. HOPKINS



E. A. BARBEAU

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AS SIMPLE AS **TUNING A RADIO**

Smootharc Single CurrentControl is as modern and effective as single dial control and tuning in radio receivers.

HAVE THIS PATENTED EXCLUSIVE FEATURE OF

NGLE GURRENT THE ADVANTAGES OF SINGLE-

COMBINES ALL THE DESIRABLE
FEATURES FOR A WIDE RANGE
OF WELDING CURRENTS....

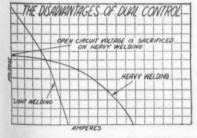
MAINTAINS ESSENTIAL HIGH OPEN CIRCUIT VOLTAGE AT ALL CURRENT SETTINGS.....

STEEP VOLT AMPERE CURVE

VOLT AMPERE CURVE OF SMOOTHARC WELDER

Proper and regulated excitation voltage for each current setting is automatic in the Smootharc Welder through shifting exciter brushes with welding current carrying brushes ... all achieved by the Smootharc perfected single current control system.

nage current control system. forvides "steep" voltage curve for light weld-ag, indicating light penetration for light auge welding, preventing the arc from lowing through the sheets. "Flat" curve or heavy welding, indicating high reserve sat capacity in the arc for heavy difficult relds. Note that high open circuit voltage smaintained at all settings.





Two difficult manual ad-justments— welding cur-rent and open circuit voltage— are required by multiple and dual conwelders.

Single, automatic current control which provides easier, faster and superior welding is a patented, exclusive feature of Smootharc Welders. . . . The current setting, shown by a clear reading indicator, is automatically and positively maintained by the Smootharc generator under continuous duty-without further attention by the operator or the manipulation of complicated dual control devices. . . . Only Smootharc Welders have this patented feature of Single Current Control. Investigate and test this outstanding feature. Send for bulletin giving complete information.

HARNISCHFEGER CORPORATION

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JUST TURN THE HANDWHEEL AND THE MACHINE DOES THE REST

MILWAUKEE, WISCONSIN

·-

SMOOTHARC WELDING WITH SMOOTHARC WELDERS ... FOR SUPERIOR PERFORMANCE

ton, Ohio. Mr. Young was graduated from the University of Indiana in 1921. Joseph Kinney has been appointed assistant manager of machinery sales. Mr. Kinney joined United in 1931 and has been associated with the machinery sales division since that time. He was in the class of 1926 at Dartmouth College and previous to joining United was associated with industrial sales and manufacturing companies.

JAMES W. HOOK, president, Geometric Tool Co., New Haven, Conn., has been made president of the New England Council.

. . .

LESLIE E. GEOHEGAN, vice-president and general manager of the Gulf States Steel Co.; WADE H. OLDHAM, vice-president of the Republic Steel Corp.; H. A. BERG, president of Woodward Iron Co.; KARL LANDGREBE, vice-president of the Tennessee Coal, Iron & Railroad Co., and HERBERT P. LADDS, vice-president and general manager, Lamson & Sessions Bolt Co. have been elected directors of the Birmingham Chamber of Commerce.

D. L. MATHIAS, formerly identified with the staff of the research laboratory of the Westinghouse Electric & Mfg. Co., East Pittsburgh, has been made research engineer in charge of electrode re-

search and development for the Metal & Thermit Corp., New York. He was graduated from Carnegie Institute of Technology in 1914 and up until 1920 was employed as a metallurgist for the Mackintosh-Hemphill Co. For the following seven years he was editor of Heat Treating and Forging, returning to the Mackintosh-Hemphill Co. in 1927. He joined the process engineering department of the Westinghouse company as metallurgist on arc-welding problems and was later transferred to the research laboratories.

. . .

WILLIAM MONROE WHITE, manager of the hydraulic department, Allis-Chalmers Mfg. Co., Milwaukee, has departed on a world cruise, sailing from San Francisco late in November.

EDWARD J. HANLEY has been appointed secretary of the Allegheny Steel Co., Brackenridge, Pa. Mr. Hanley succeeds Frank H. Stevens, who has resigned from the post but continues as vice-president and treasurer of the company.

C. W. BALKE, director of research, Fansteel Metallurgical Corp. and Vascoloy-Ramet Corp., Chicago, will speak on "Refractory Metals and the Uses of Their Carbides in Tool Material" before the Superintendents' and Foremen's Club of the Chicago branch of the

National Metal Trades Association on Dec. 12 at the Hotel Sherman.

. . .

NORMAN FRANKLIN, of the Jackson Iron & Metal Co., Jackson, Mich., has been elected president of the Michigan chapter of the Institute of Scrap Iron and Steel. Other officers elected include, vice-president, B. KRAMER, Modell Iron & Metal Co., Detroit; secretary, Milton Mahler, Morrow Steel Co., Detroit; treasurer, A. Kasle, A. Kasle Co., Detroit.

JOSEPH E. JACOBSON, of Luria Brothers & Co., Inc., Pittsburgh, has been elected president of the Pittsburgh chapter of the institute. MEYER W. SINGER, M. W. Singer & Co., Pittsburgh, has been elected vice-president; RICHARD ROSENBERG, Pennsylvania Iron & Steel Co., secretary, and DAVID L. WILKOFF, of the company of the same name, treasurer.

SAM KASLE, Kasle Iron & Metal Co., Toledo, has been elected president of the northern Ohio chapter of the institute. Other officers elected include, first vice-president,



D. M. PATTISON, whose appointment as new manager of the Cleveland sales territory for the Warner & Swasey Co. was announced in these columns last week.

Cut Cutting-off Machine Hours in Half

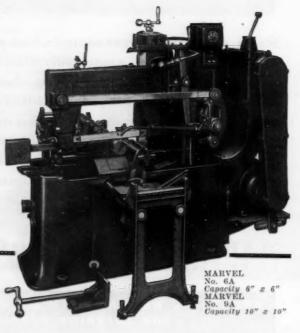
MARVEL Production Saws, with automatic bar push up are ending the cutting-off "bottle-neck" in many plants. Heavy Duty full ball-bearing, production tools, they cut off identical lengths at high speed with no more attention than an automatic screw machine.

Compared with other cutting-off methods they reduce machine-hours to a fraction—cut 10 pieces 6" round, 160 pieces 1½" round or other sizes in proportion per hour, floor to floor. Made in two sizes, they will handle nested small bars or large stock to 10" x 10"—save time, reduce chip loss, and keep production lines moving. Write for Bulletin 600.

MARVEL

Automatic
Hack Saw Machines

Armstrong-Blum Mfg. Co.
"The Hack Saw People"
349 N. Francisco Ave.
CHICAGO, U. S. A.



E. STEIN, United Iron & Metal Co., Canton, Ohio; second vice-president, MAX FRIEDMAN, of the company of the same name, Cleveland; secretary, T. P. HODGKISS, Lederer Iron & Steel Co., and treasurer, B. NEWMAN, of Luntz Iron & Steel Co., Cleveland.

. . .

GRANT GOODWIN, formerly metallurgist of the Muehlhausen Spring Co., has been made district manager of the Indiana and southern Illinois territory for the Lindberg Engineering Co., Chicago. He will make his headquarters at 503 Illinois Building, Indianapolis.



R. WALLACE SMITH, formerly identified with the Kobe, Japan, office of the Hanson-Van Winkle-Munning Co., has been appointed Cleveland representative of the J. C. Miller Co., Grand Rapids, Mich. R. L. REDMOND, heretofore chief chemist in charge of plating for the Metal Moulding Corp., Detroit, has been made Detroit representative of the Miller company, with office in the Stormfeltz-Lovely Building.

. IRVING L. KORDENBROCK, formerly associated with the Famous-Barr Co., St. Louis, as manager of the electrical appliance department, has joined the fan sales staff of the Emerson Electric Mfg. Co., St. Louis.

0 0 0

H. A. SCHULTZ, manager of the bureau of safety, sanitation and welfare of the United States Steel Corp., will act as chairman of the steel and iron division in the United Hospital campaign in New York.



HERMAN L. WECKLER, formerly assistant to K. T. KELLER, president of the Chrysler Corp., has been appointed vice-president and general manager of the DeSoto Motor Corp., Chrysler subsidiary. Mr. Weckler is a graduate of the Carnegie Institute of Technology. His first job was with the Jones & Laughlin Steel Co. In 1908 he became associated with the American Locomotive Works in Pittsburgh as shop engineer and remained with that company until 1911, when he joined the Buick Motor Co. at Flint, Mich. At the time he left Buick in 1932 to become associated with the Chrysler Corp., he had risen to the position of works manager of the Flint plants. During the last several months Mr. Weckler has been in charge of building and equipping the new \$5,000,000 DeSoto plant recently completed in Detroit. The new plant consists of both an assembly line and a new stamping plant. While on Mr. Keller's staff Mr. Weckler's principal function was to handle industrial relations problems for the corporation.



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R. H. PRATT, assistant general manager of sales, and H. S. Lock-



FOR

Screening and Grading . grains, minerals, food products and other materials.

Draining and Separating . liquids from solids.

Safety Guarding . . offering extreme visibility, durability and protection.

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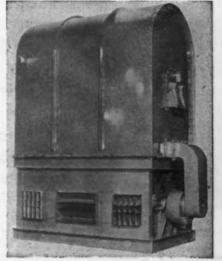
wood, manager of the merchant products department, both of the New York office of the American Steel & Wire Co., are retiring from active service. F. CONNELL, present manager of the manufacturers department, has been appointed assistant general manager of sales and T. P. Lowerre, present manager of the merchant products department, Baltimore, is being transferred to New York as manager of the merchant products department.

Lee Direct Fired Unit Heaters

For Steel Mill and Steel Warehouse Heating

Economical Operation - High Efficiency — Durability — No Stand-by Losses — No Boiler Plant — Installation and Maintenance Costs Reduced to a Minimum Flexibility of Operation - Self Contained Automatically controlled - Unit Adaptable to Space Heating or Spot Heating by Means of Duct System - Portable. Designed for firing with oil, gas, coal, coke, or coke breeze, this heater can be either manually or automatically controlled. Cold air is taken in along the floor and hot air delivery can be either at floor level or at any distance above the floor. Built in large capacities. Delivers dry hot air for warehouses. No steam leaks.

Write to Dept. A.B. for bulletin containing detailed information.



Patent applied for

DRAVO-DOYLE COMPANY, Pittsburgh, Pa.

Railroads Active in Steel Research

SCIENTIFIC research activities conducted by the railroads of the country to bring about improvements in service and increased efficiency in operation, reached a new high level in 1936, according to a statement from the Association of American Railroads.

"Outstanding," the association said, "were the studies made by the division of equipment research with a view of ascertaining what improvements can be made in the present systems in use by the principal railroads throughout the country for air-conditioning passenger equipment and what can be done toward standardizing that equipment in order to reduce costs of installation and maintenance."

Exhaustive tests are being undertaken to determine methods of improving the present process of rolling steel rails. The quality of rails has been greatly improved, according to the association, as a result of tests now being carried on at the University of Illinois. "These tests have demonstrated," the statement says, "that by controlling the temperatures of steel rails immediately after emerging from the rolling mills, imperfections in those rails can be prevented. In connection with these tests, experiments are

now being made to ascertain the practicability of hardening the ends of rails where most of the wear occurs.

"The railroads through the engineering section of this association are studying the advantages that might come from the continuous welding of rails and also the advisability of increasing the length of rails. By having increased the length of rails in recent years from 30 ft. to 39 ft., the number of joints was reduced 23 per cent."

Experiments are also being conducted to determine the extent to which steel alloys can be used in the construction of both freight and passenger cars. "After extensive experiments four years ago a new type, light-weight steel car was adopted as standard by the railroads of this country. A newly designed box car made of alloy steel and weighing approximately 8000 lb. less than the present standard car is now being subjected to a series of rigid tests to determine whether it can meet with present day operating requirements. A design for an improved 40-ton refrigerator car for fruits and vegetables, but of lighter weight than those now generally in use, is in the course of preparation.

"Extensive preparations in connection with manufacturers are also being conducted in the matter of fusion welding of tank cars with a view of reducing their weight without affecting their strength."

Tests are also being conducted on brake shoes and various types of draft gear. The draft gear experiments are being conducted at Purdue University, where a special laboratory has been built.

Conventions

Nov. 30 to Dec. 4—American Society of Mechanical Engineers. Engineering Societies Building, 29 West 39th Street, New York. C. E. Davies, 29 West 39th Street, New York, secretary.

Nov. 30 to Dec. 5—National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York. Charles F. Roth, 701 Grand Central Palace, manager.

Dec. 2 and 3—Associated General Contractors of America—New York State Highway Chapter, DeWitt Clinton Hotel, Albany. Harry R. Hayes, DeWitt Clinton Hotel, secretary.

Dec. 2 to 4—American Society of Refrigerating Engineers, Hotel Pennsylvania, New York. David L. Fiske, 37 West 39th Street, New York, secretary.

Dec. 3 and 4—American Management Association, Waldorf-Astoria, New York. Alvin E. Dodd, 330 West 42nd Street, New York, president.

Dec. 7 and 8—National Standards Parts Association, Sherman Hotel, Chicago. E. P. Chalfant, 1420 United Artists Building, Chicago, executive vice-president.

Dec. 7 and 8—Motor and Equipment Wholesalers Association, Stevens Hotel, Chicago. N. W. Ruark, 400 West Madison Street, Chicago, general manager.

Dec. 8—Illinois Manufacturers Association, Stevens Hotel, Chicago. James L. Donnelly, 120 South La Salle Street, Chicago, secretary.

Dec. 9 and 10—National Association of Manufacturers and Congress of American Industry, meeting with National Industrial Council, Waldorf-Astoria, New York. Noel Sargent, 11 West 42nd Street, New York, secretary.

Dec. 9 to 13—Automotive Industries Show. Exhibit under joint sponsorship of Motor and Equipment Wholesalers Association and the National Standard Parts Association to be held in the Navy Pier, Chicago. N. W. Ruark, 400 West Madison Street, Chicago, general manager.

Dec. 10—Grinding Wheel Manufacturers Association, Green Hill Farms, Philadelphia. Harry B. Lindsay, 27 Elm Street, Worcester, Mass., secretary.

SCRAP BALERS



STYLE **100 TC** (100 x 51 x 36) and other sizes

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Double
Ram Presses
in all sizes



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COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES AND PUMPS

74-THE IRON AGE, November 26, 1936

Steel Imports Up 6 Per Cent — Exports Lower

Imports (In Gross Tons)	September		Nine Months Ended September	
Imports (in dross rous)	1936	1935	1936	1935
et a land	15.080	14.357	137.607	81,930
Pig iron	29	149	1,409	966
Ferromanganese ¹	2.778	110	18,123	
Sniegeleisen	4,173	4,256	30,807	35,128
Ferrochrome ²		* * * *	21	1
Ferrosilicon ³	1	54	447	571
Other ferroalloys'	100		526	07.040
Scrap	8,932	11,226	97,139	27,242
Pig iron, ferroalloys and scrap	31,093	30,042	286,079	1,601
Steel ingots, blooms, etc	10 82	340	615	
Wire rods	1,607	1,495	14,379	10,407
Semi-finished steel	1,699	1,835	15,073	12,008
Concrete reinforcement bars	178	494	3,263	2,504
Hollow steel bars	253	177	1,598	860
Merchant steel bars	4,237	1,983	28,889	17,596
Iron slabs	****	****		****
Iron bars	135	14	1,007	1,160
Boiler and other plate	174	97	376	484
Sheets, skelp and saw plate	3,119	2,189	17,037	7,522
Die blocks or blanks, etc.5	5	18	158 145	156
Tin plate	5,211	2,766	41.135	27,890
Sheet piling	46	2,100	2,197	21,000
Rails and track material	1.290	154	6,237	3.075
Welded pipe	994	1,479	4.749	3,179
Other pipe	5,504	1,881	19,485	12,384
Cotton ties	163	2,347	1,629	7,301
Other hoops and bands	2,156	2,525	17,755	16,968
Barbed wire	733	1,931	11,939	18,333
Round iron and steel wire	449	308	3,779	2,967
Telegraph and telephone wire	232	101	36	21
Flat wire and steel strips	182	161 190	2,165 1,802	1,278 1,404
Other wire	346	132	1.353	883
Nails, tacks and staples	1.440	2,237	17,720	14,682
Bolts, nuts and rivets	27	6	413	233
Horse and mule shoes	41	46	300	491
Rolled and finished steel	26,919	21,135	185,167	141,371
Malleable iron pipe fittings	37		130	46
Cast iron pipe and fittings	79	* * * * *	377	27
Castings and forgings	166	146	949	936
Total	59,993	53,158	487,775	300,227

¹ Manganese Content. ² Chrome Content. ³ Silicon Content. ⁴ Alloy Content. ⁵ New classes. No comparable figures for previous year.

Exports (In Gross Tons)	Seg	otember	Nine Months Ended September	
Zaporto (an Grood admo)	1936	1935	1936	1935
Pig iron	321	451	1,690	2.564
Ferromanganese and spiegeleisen	16	1	334	42
Other ferroalloys ⁵	141		1,957	14
Iron and steel scrap		170,434	1.590,004	1,651,560
Tin plate scrap	1,589	2,483	11,773	27,386
Waste-waste tin plate	3,232	883	28,829	16,044
Pig iron, ferroalloys and scrap	157,613	174,252	1,634,587	1,697,596
Ingots, blooms, billets, sheet bars	1.097	1.540	13,498	35,195
Skelp	5,781	2,894	33,237	32,277
Wire rods	1,541	2,200	27,137	18,878
Semi-finished steel	8.419	6,634	73.872	86,350
Bars, concrete reinforcement5	229		2,603	
Bars, other steel	4.011	3.719	36,545	40.697
Iron bars	63	79	851	789
Plates, iron and steel	5,493	4.226	51,538	30,710
Sheets, galvanized steel	4.211	5,039	40,484	55,199
Sheets, galvanized iron	151	219	1,212	1.395
Sheets, black steel	10.199	7.858	99,189	76,574
Sheets, black fron	431	469	5,600	4.084
Hoops, bands, strip steel	4.942	3.366	45,285	32,181
Tin plate and taggers' tin	8.893	11,397	171,250	87,579
Terne plate (including long terne)	50	162	2,528	1,713
Structural shapes, plain material	5,973	4.194	42,416	24.839
Structural material, fabricated	2.108	1,555	13,462	16,883
Sheet piling	204		1,949	
Tanks, steel	1,155	375	17.145	4.682
Steel rails	2,374	3,264	53,764	38,042
Rail fastenings, switches, spikes, etc	887	818	9,447	7,375
Boiler tubes	499	892	4,951	6.814
Casing and oil line pipe	2,523	1,257	18,569	22,038
Pipe, black and galvanized, welded steel	1,242	2,555	14,401	26,499
Pipe, black and galvanized, welded iron	278	286	2,789	2,496
Plain wire	3,935	2,548	33,529	27,677
Barbed wire and woven wire fencing	3,739	1,784	25,627	24,068
Wire cloth and screening	117	73	822	783
Wire rope	352	307	2,478	3,104
Wire nails	642	830	5,847	7.940
Other halls and tacks	256	294	2,445	2,787
Other wire and manufactures	280	298	3,538	3,778
Bolts, nuts, rivets and washers, except				
track	639	575	4,719	4,850
Other finished steel	164	126	1,587	1,111
Rolled and finished steel	66,040	58,565	716,570	556.687
Cast iron pipe and fittings	941	2,859	14,032	12,310
Malleable iron screwed fittings	364	247	2,516	2,577
Carwheels and axles	1,080	449	5,947	12,569
Iron castings	480	431	5,383	6,665
Steel castings	391	298	2,455	2,135
Forgings	243	632	2,961	4,259
Castings and forgings	3,499	4,916	33,294	40,515
Total	235,571	244,367	2,458,323	2,381,148

NITED STATES imports of iron and steel products during September were at a somewhat higher level than in August. Exclusive of scrap, aggregate imports during September totaled 51,061 gross tons, compared with 48,179 tons in August. The outstanding increase, 2556 tons, was registered in pig iron receipts, followed by those in "other pipe," 2120 tons; sheets, skelp and sawplate, 1057 tons. Scrap imports totaled 8932 tons, compared with 12,518 tons in the previous month.

Exports in September declined to 235,571 tons from 295,314 tons in August. Exports of scrap showed a loss of almost 22 per cent, or from 194,600 tons, in August, to 152,314 in September. Other categories showing losses included tin plate, which dropped from 14,641 tons to 8893 tons; iron and steel plates, from 7542 tons to 5493 tons, and steel rails, from 12,126 tons to 2374 tons.

Total exports for the nine months ended September were 2,458,323 tons, compared with 2,-381,148 tons in the corresponding period last year.

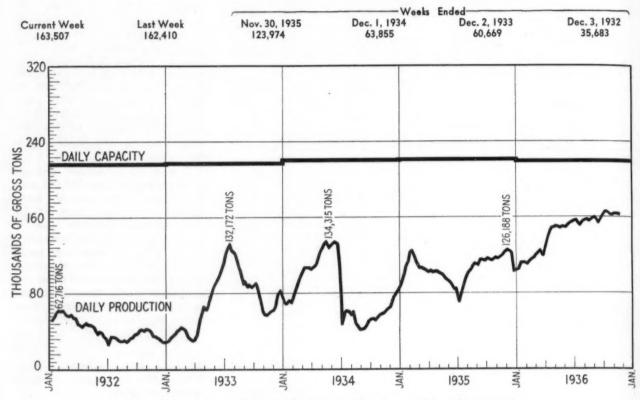
September Imports of Iron and Manganese Ores

(In Gross Tons) Manga-nese Con-centrates, 35 Per Cent or Over Iron Ore 1936 1935 1935 Canada 31,724 Cuba 55,500 Chile 131,650 10,416 87,800 Spain Spain Spain Spain Spain Sweden French Africa Russia India Brazil Gold Coast 20,573 15.450 Gold Coast ... 1 Countries . 18,643 19,285 Total258,090 165,298 33,237 16,418

September Imports of Pig Iron by Countries of Origin

STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1932-1936



Figures for the current week are not indicated on the chart until the following week.

		Current	Trient AA eeks Ended				
	District	Week	Last Week	Oct. 31, 1936	Nov. 30, 1935	Dec. 1, 1934	
	Pittsburgh	71.0	69.0	70.0	46.0	18.0	
STEEL INGOT	Chicago	77.0	76.0	75.0	62.0	33.5	
SIEEE 114001	Valleys	74.0	74.0	76.0	58.0	32.0	
PROPUSTION	Philadelphia	54.5	55.0	55.5	40.0	24.0	
PRODUCTION	Cleveland	78.0	78.0	84.0	80.0	39.0	
	Buffalo	84.0	84.0	78.0	33.0	24.0	
BY DISTRICTS:	Wheeling	86.0	93.0	93.0	80.0	55.0	
DI DISTRICTS.	Southern	69.5	69.5	58.0	46.0	21.0	
D C	Ohio River	95.0	95.0	95.0	85.0	35.0	
Per Cent	Western	59.0	59.0	59.0	40.0	15.0	
	St. Louis	72.0	70.0	72.0	64.0	25.0	
of Capacity	Detroit	100.0	100.0	100.0	95.0	52.0	
	Eastern	85.0	85.0	90.0	40.0	25.0	
	Aggregate	74.5	74.0	74.0	56.0	29.0	
	Average Year to Date	66.3	66.1	65.5	47.7	37.4	

Weekly Booking of Construction Steel

From THE IRON AGE

	Week Ended				Year	Year to Date	
N	ov. 24, 1936	Nov. 17, 1936	Oct. 27, 1936	Nov. 26, 1935	1936	1935	
Fabricated structural steel awards	18,365	9,200	9,300	23,100	947,795	712,090	
Fabricated plate awards	1,390	1,065	9,760	1,530	194,250	133,150	
Steel sheet piling awards	400	400	1,575	180	52,765	57,885	
Reinforcing bar awards	8,140	3,525	7,145	6,700	310,640	287,165	
Total Lettings of Construction Steel	28,295	14,190	27,780	31,510	1,505,450	1,190,290	



....SUMMARY OF THE WEEK. .

- ... Price advances of \$1 to \$4 on semi-finished and finished steel.
- ... Pig iron also \$1 higher in all centers, effective at once.
- ... Large volume of steel buying expected before Dec. 1, when new prices take effect.

PRICE advances of \$1 to \$4 a ton on semi-finished and finished steel and \$1 a ton on pig iron, which had been expected by buyers, were announced on Monday and Tuesday of this week and were preceded by an increased volume of anticipatory buying, resulting in a slight bulge in steel plant operations in some districts and an average for the country as a whole of $74\frac{1}{2}$ per cent, up a half point from last week. Indications point to a heavy volume of steel buying within the next few days that will sustain ingot output at its present rate, or higher, until the end of December.

The official announcement of the Carnegie-Illinois Steel Corp., which initiated the steel price advances, was issued late Monday and was followed Tuesday by statements that other steel companies would adopt the same quotations. Buyers are given only until the last day of November to enter orders at present prices for December shipment, the new prices for first quarter going into effect Dec. 1. In pig iron the price advances take effect immediately.

It is the intention of the steel mills to take only as much business at current prices as can be rolled and shipped during December, but it is quite possible that the volume of buying may necessitate the carryover of some of the lower-priced tonnage into January. However, the higher operating costs of the steel companies will make them more exacting in restricting purchases than they have usually been at the time of a price advance.

THE principal price advances are as follows: Forging quality semi-finished, \$1; rerolling quality, \$2; alloy billets, \$4; bars, shapes, plates and sheet piling, \$3; cold-finished steel bars, \$4; hot-rolled strip, tin mill black plate and all grades of sheets, except vitreous enameling, \$4; vitreous enameling, \$3; rails, from \$36.375 to \$39; tie plates, \$2; wire rods, \$3; bright wire, \$2; spring

wire, \$3; nails, \$4 and other wire products \$2 to \$4.

No price has been announced on cold-rolled strip, on which prices may be \$5 or \$6 a ton higher. Skelp and reinforcing bars have not been mentioned in price announcement, but there may be advances on these products. Tin plate was covered by an adjustment a week ago which leaves the net price nominally unchanged. An important product on which no advance is likely is pipe, the unsatisfactory resale situation in some jobbing centers making it appear difficult to establish a higher price level at this time.

WHILE steel companies will not be able to accept much business in sheets for December shipment, there are open schedules in most other products, but it is expected that they will very quickly be filled up. In addition to the requirements of manufacturing consumers and jobbers, there is overhanging the market a substantial tonnage of steel for specific projects, such as buildings, bridges, subways, dams, railroad cars and locomotives, on which price protection good for 60 days can be obtained from the mills.

Railroad equipment orders and inquiries have spurted, and there will be a large volume of rail orders, possibly as much as 500,000 tons, before the effective date of the new rail price, Dec. 1. Among new equipment inquiries are 2000 large freight cars for the Bessemer & Lake Erie and 900 for the Union Railroad, both U. S. Steel Corp. roads; 500 freight cars for the Chicago & North Western, 400 freight cars and three passenger cars for the Gulf, Mobile & Northern, 250 to 1000 large ore cars for the Duluth, Missabe & Northern, 125 freight cars for the Chesapeake & Ohio, in addition to 2000 inquired for a week ago, and 110 to 250 subway passenger cars for the Board of Transportation, New York. The Western Maryland is inquiring for 10 locomotives, the Delaware, Lackwanna & Western for five, and the Burlington will build 11 in its own shops. The Milwaukee road has ordered 31 engines and the Rock Island 350 freight cars and three streamlined trains. An order for 200 tons of stainless steel for streamlined trains has been placed at Philadelphia.

THE immediate effectiveness of pig iron price increases raises THE IRON AGE pig iron composite \$1 a ton to \$19.73, highest since December, 1926. Composite prices of finished steel and scrap are unchanged.

Inland Steel Co. will build a blast furnace, the first in this country since 1930.



- ... Carnegie-Illinois Steel Corp. announces steel price advances.
- ... New quotations for first quarter, effective Dec. 1, up \$2 to \$4 a ton.
- ... Pig iron increase of \$1 goes into effect immediately.

PITTSBURGH, Nov. 24.—The long awaited price advances have been announced. All grades of pig iron have been advanced \$1 a ton and the higher prices will apply on new orders for shipment to the end of the year. Large consumers are adequately covered at present prices for their fourth quarter requirements.

All advances announced by the Carnegie-Illinois Steel Corp. on steel products are effective Dec. 1, and producers are expected to hew closer to the line on shipments than has hitherto been the practice, as the new prices must be realized as quickly as possible in order to offset increased operating costs.

Rerolling billets will be up \$2 a ton, forging billets up \$1 and alloy steel billets up \$4. No announcement has been made on the price of skelp, although there is a possibility that this item may be advanced. Hot-rolled bars, plates and shapes and steel sheet piling are up \$3. Cold-finished bars will be up \$4 a ton, effective Jan. 1. Hotrolled strip, tin mill black plate and all grades of sheets will be advanced \$4 a ton except enameling sheets, which are slated for a \$3 a ton advance. Cold-rolled strip prices have not been announced, but may reflect a \$5 or \$6 a ton advance. Rails have been boosted from \$36.375 to \$39 a ton and tie plates will be advanced \$2 a ton. In the wire category, rods will be advanced \$3, bright wire \$2, spring wire \$3, nails \$4 and other products \$2 to \$4.

Demand for all steel products has picked up considerably in the past few days. This is accounted for in some measure by anticipation of higher prices. Substantial additions to unfilled orders will be made within the next week as consumers attempt to place as much tonnage as possible in order to escape price advances.

Operations in the Pittsburgh district have moved up two points to 71 per cent of capacity, while ingot output in the Wheeling district has dropped seven points to 86 per cent, owing to the shutdown during the week of a steel company's bessemer plant.

Pig Iron

Some producers in this district have announced a price increase of \$1 a ton on all grades, effective immediately. It is the general understanding that this advance will apply on new orders for shipment before the end of the year. The price rise caused little stir as practically all consumers are protected on their requirements to the end of the year.

Semi-Finished Steel

Prices on semi-finished steel for first quarter delivery, effective Dec. 1, reflect a \$2 a ton advance on rerolling billets, blooms, slabs and sheet bars. Forging blooms, billets and slabs have been advanced \$1. while no definite information on skelp is available as yet. Consumers have been using up stocks and, as a result, specifications over the next several weeks will show substantial increases. Meanwhile. there is a distinct tendency on the part of producers not to allow any heavy piling up of orders at present quotations.

Bolts, Nuts and Rivets

With wire rods and hot-rolled bars slated for an advance, there is little doubt that bolt and nut prices will show an increase shortly. Meanwhile, new business is on a par with that of a week ago, Bookings by automobile manufacturers are coming in steadily as are orders from railroads and miscellaneous sources.

Rars

Hot-rolled carbon bars are slated for an advance of \$3 a ton, effective Dec. 1, for first quarter shipment. This increase was expected in view of the steadily mounting costs of steel making. Under the present circumstances, it is unlikely that producers will load up their mills at present prices. It is the intent of steel companies to clear their mills of orders which are now on the books and those taken between now and Dec. 1, by at least the middle of January. Meanwhile, specifications within the past few days have shown substantial improvement, which is accounted for in a large degree to anticipation of a price advance. Alloy steel bars will be advanced \$4 a ton.

Cold-Finished Bars

Cold-finished bars will be up \$4 a ton, effective Jan. 1. Tonnages placed at present quotations must be shipped from the mills before the end of January, 1937. New business had been slowly increasing over the past several weeks and during the last few days a substantial bulge in specifications has occurred. Further increases in new business are expected between now and the time the new prices become effective. Automobile companies are buying heavily, and there has effective. been no falling off in the consistent demand from household appliance manufacturers. Unusually steady buying on the part of jobbers indicates a steady rate of consumption on the part of small buyers.

Shapes and Plates

Demand for shapes and plates is still far from satisfactory, although the price increases of \$3 a ton effective Dec. 1 on first quarter shipments should drive in some new business. There is little doubt that many projects near the final stage will be speeded up in order that commitments might be made on identified jobs. This week again found inquiries for privately financed projects ahead of those sponsored by public funds. nages involved run from 300 to 500 tons, but in the aggregate are encouraging. American Bridge Co. will fabricate 880 tons of plates and shapes for transmission towers at Knoxville, Tenn.

Reinforcing Steel

No announcements with respect to first quarter prices have been made but it is expected there will be an advance. Meanwhile, orders

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Rails, heavy, at mill\$36.37½\$36.	
Rails, heavy, at mill\$36.37½\$36.	
Light rails, Pittsburgh	1935
Rerolling billets, Pittsburgh 32.00 32.0	
Sheet bars, Pittsburgh	19.50
Slabs, Pittsburgh	20.2007
Forging billets, Pittsburgh. 39.00 39.00 39.00 39.00 39.00 35.00 Basic, del'd eastern Pa. 21.8132 20.8132	15.50
Wire rods, Nos. 4 and 5, P'gh 40.00 40.00 40.00 40.00 40.00	19.50
Cents Cents Cents Cents Cents Malleable, Chicago*	20.8132
Skelp, grvd. steel, P'gh, lb. 1.80 1.8	19.00
Finished Steel Per Lb.: Bars, Pittsburgh Bars, Chicago 2.10 2.10 2.10 2.10 2.10 2.10 2.10 2.10	19.50
Finished Steel Per Lb.: Bars, Pittsburgh Bars, Chicago 2.10 2.10 2.10 2.10 2.10 2.10 2.10 2.10	19.50
Finished Steel Per Lb.: Cents Cents Cents Cents Bars, Pittsburgh 2.05 2.05 2.05 1.85 Bars, Chicago 2.10 2.10 2.10 1.90 Cents Cents lots	25.2528
Per Lb.: Cents Cents Cents Cents Bars, Pittsburgh 2.05 2.05 2.05 2.10 2.10 2.10 2.10 2.10 2.10 Cents Cents †This quotation is subject to a deduction of 38c. a phosphorus content of 0.70 per cent or higher. The switching charge for delivery to foundries in teach of the case of district is 60c. per ton.	0 = 00
Bars, Pittsburgh	85.00
Bars, Chicago	on for
Bars, Chicago 2.10 2.10 1.90 cago district is 60c. per ton.	o Chi-
	ie Citi-
Bars, Cleveland 2.10 2.10 1.90	
Bars, New York 2.40 2.40 2.20 Scrap	
Plates, Pittsburgh 1.90 1.90 1.80 Scrap	
Plates, Chicago 1.95 1.95 1.95 1.85 Per Gross Ton:	
Plates, New York 2.19 2.19 2.19 2.09 Heavy melting steel, P'gh\$17.25 \$17.25 \$17.50	13.75
Structural shapes, Pittsburgh 1.90 1.90 1.90 1.80 Heavy melting steel, Phila 14.75 14.75 15.75	12.50
Structural shapes, Chicago 1.95 1.95 1.85 Heavy melting steel, Ch'go 16.50 16.50 16.25	13.50
Structural shapes, New York 2.16 1/4 2.16 1/4 2.16 1/4 2.06 1/4 Carwheels, Chicago 16.50 16.50 16.50	13.25
Cold-finished bars, P'gh 2.35 2.35 2.35 1.95 Carwheels, Philadelphia 16.75 16.75	12.75
Hot-rolled strips, P'gh 1.95 1.95 1.95 1.85 No. 1 cast, Pittsburgh 16.25 16.25	14.25
Cold-rolled strips, P'gh 2.60 2.60 2.60 No. 1 cast, Philadelphia 16.75 16.75	12.75
Hot-rolled annealed sheets, No. 1 cast, Ch'go (net ton) 14.00 14.00 14.00	11,75
No. 24, Pittsburgh 2.60 2.60 2.60 2.40 No. 1 RR. wrot., Phila 15.75 15.75	12.25
Hot-rolled annealed sheets, No. 1 RR, wrot., Ch'go (net) 14.25 14.25 14.25	11.00
No. 24, Gary 2.70 2.70 2.50	
Sheets, galv., No. 24, P'gh 3.20 3.20 3.20 3.10 Sheets, galv., No. 24 Garv. 3.30 3.30 3.30 Coke, Connellsville	
Directory Bearty 2101 21, Citaty	
Hot-rolled sheets, No. 10,	
Pittsburgh	\$3.60
Hot-rolled sheets, No. 10, Gary	4.25
Gary	
Pittsburgh	
Cold-rolled sheets, No. 20.	
Gary 3.15 3.15 3.05 Per Lb. to Large Buyers:	0.00
Wire nails, Pittsburgh 2.05 2.05 2.05 2.40 Electrolytic copper, Conn 10.50 10.50 9.75	9.00
Wire nails, Chicago dist. mill 2.10 2.10 2.10 2.45 Lake copper, New York 10.62½ 10.62½ 9.87½	9.37 1/2
Plain wire, Pittsburgh 2.50 2.50 2.50 2.30 Tin (Straits), New York 52.00 51.87 1/2 44.45	51.25
Plain wire, Chicago dist. mill 2.55 2.55 2.55 2.35 Zinc, East St. Louis 5.05 5.05 4.85	4.85
Barbed wire, galv., P'gh 2.55 2.55 2.56 Zinc, New York 5.42½ 5.42½ 5.22½	5.221/2
Barbed wire, galv., Chicago Lead, St. Louis 5.05 5.05 4.55	4.35
dist. mill	4.50
Tin plate, 100 lb. box, P'gh. \$5.25 \$5.25 \$5.25 Antimony (Asiatic), N. Y 12.50 12.50	14.75

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Pig Iron

Finished Steel

Non 04 1000		\$19.73 a Gross Ton	
Nov. 24, 1936 One week ago One month ago One year ago	2.197c. a Lb. 2.197c. 2.197c. 2.130c.	18.73 18.73 18.73 18.84	\$16.17 a Gross Ton 16.17 16.50 13.25
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.
	HIGH LOW	HIGH . Low	HIGH LOW
1936. 1934. 1933. 1932. 1931. 1930. 1929. 1929. 1927.	2.197c., Sept. 29; 2.084c., Mar 10 2.130c., Oct. 1; 2.124c., Jan. 8 2.199c., April 24; 2.008c., Jan. 2 2.015c., Oct. 3; 1.867c., April 18 1.977c., Oct. 4; 1.926c., Feb. 2 2.037c., Jan. 13; 1.945c., Dec. 29 2.273c., Jan. 7; 2.018c., Dec. 9 2.317c., April 2; 2.273c., Oct. 29 2.286c., Dec. 11; 2.217c., July 17 2.402c., Jan. 4; 2.212c., Nov. 1	\$19.73, Nov. 24; \$18.73, Aug. 11 18.84, Nov. 5; 17.83, May 14 17.90, May 1; 16.90, Jan. 27 16.90, Dec. 5; 13.56, Jan. 3 14.81, Jan. 5; 13.56, Dec. 6 15.90, Jan. 6; 14.79, Dec. 15 18.21, Jan. 7; 15.90, Dec. 16 18.71, May 14; 18.21, Dec. 17 18.59, Nov. 27; 17.04, July 24 19.71, Jan. 4; 17.54, Nov. 1	\$16.75, Sept. 22; \$12.67, June 9 13.42, Dec. 10; 10.33, April 23 13.00, Mar. 13; 9.50, Sept. 25 12.25, Aug. 8; 6.75, Jan. 3 8.50, Jan. 12; 6.43, July 5 11.33, Jan. 6; 8.50, Dec. 29 15.00, Feb. 18; 11.25, Dec. 9 17.58, Jan. 29; 14.03, Dec. 3 16.50, Dec. 31; 13.08, July 2 15.25, Jan. 11; 13.08, Nov. 22

Steel Scrap

have been fairly light, but mills are busily engaged getting out material on the books. Resale prices are reported to be firmer than at any time in the last several months.

Rails and Track Accessories

Effective Dec. 1 for first quarter shipment, rails will be advanced to \$39 a gross ton. Tie plates will be increased \$2 a ton and angle splice bars will be up \$3 a ton.

Strip

First quarter quotations effective Dec. 1 on hot-rolled strip are up \$4 over present prices. As yet no formal announcement has been made regarding cold-rolled strip, although a \$5 or \$6 boost is likely. Meanwhile, demand has been increasing and some of the improvements is anticipatory buying. Automobile manufacturers have been taking heavier tonnages and there has been no let up in bookings from miscellaneous sources. New business over the next week will probably be extremely heavy, in view of the advance in prices.

Tin Plate

Tin plate operations continue around 89 per cent. There has been no change in the rate of incoming orders from last week. A good many of the orders now being received from general line can manufacturers are for rush shipment. Tin plate prices effective Jan. 1, 1937, will be \$4.85 a base box Pittsburgh and \$4.95 a base box Gary, plus transportation charges in effect at the time of shipment. The customary 71/2 per cent discount on tin plate which became general under the steel code will be discontinued on Jan. 1. This makes the new price practically the same as the present net price, there being a difference of only 0.625c. a base box.

Sheets

Sheet prices effective Dec. 1 on sales for first quarter shipment, reflect a \$4 a ton increase on all grades except vitreous enameled, which is up \$3 a ton. Tin mill black plate will be advanced \$4 a ton. Sheet specifications in the past week have shown further increases both from the automotive manufacturers and miscellaneous sources. While part of this improvement is undoubtedly due to anticipation of higher prices, a large portion of the orders represent actual needs of consumers. Analysis of business other than that coming from automobile manufacturers shows railroads, metal furniture manufacturers, farm implement makers and household appliance interests specifying freely. Orders from jobbers have shown no tendency to fall off.

Steel Sheet Piling

First quarter quotations on steel sheet piling, as announced by a large producer, are \$3 a ton over present quotations. Carnegie-Illinois Steel Corp. has received the award for 965 tons of piling for the construction of a seawall at Roughan's Point, Revere, Mass.

Tubular Products

No announcement has been forthcoming as to first quarter quotations on tubular products. In the opinion of some producers, no change in pipe prices will materialize for first quarter delivery. Meanwhile, specifications are holding up well and bookings of standard pipe indicate an unseasonably good volume of business.

Wire Products

Wire prices, effective Dec. 1 for first quarter shipment, show \$3 a

ton increase for rods, \$2 for bright wire, \$3 for spring wire, \$4 for nails, polished staples, galvanized staples, galvanized barbed wire, \$2 for annealed fence wire, \$3 for galvanized fence wire, \$3 for woven wire fence and \$3 for bale ties. Specifications for both manufacturing wire and merchant wire items have been quite heavy within the past few days as most consumers were fairly certain price advances would materialize.

Coal and Coke

Both production and shipment of coal are being maintained at a high level. Producers are expending their efforts on production of furnace coke contracts already on the books. Inquiries for domestic size beehive coke have improved somewhat owing to colder weather. In some of the beehive regions, operators are facing a shortage of skilled labor which, in some cases, is affecting their production schedules.



... Awards of 8140 tons —1885 tons in new projects.

AWARDS

Chicago, 650 tons, Museum of Science and Industry, to Joseph T. Ryerson & Son,

Le Claire, Ia., 625 tons, dam across Mississippi River, to Inland Steel Co.

San Francisco, 1750 tons, University Mound Reservoir Basin for Public Utilities Commission, to Concrete Engineering Co.

San Francisco, 600 tons, pier No. 9, to Soule Steel Co.

San Francisco, 119 tons, sheds for piers Nos. 9 and 19, to Soule Steel Co.

Laguna, Cal., 1623 tons, Bureau of Reclamation project, to Columbia Steel Co.

Denver, 125 tons, Salt River Bureau of Reclamation project, to an unnamed bidder.

Denver, 932 tons, All-American Canal project, to Colorado Fuel & Iron Co.

Denver, 457 tons, All-American Canal project, to Bethlehem Steel Co.

Denver, 120 tons, All-American Canal project, to Inland Steel Co.

Idaho Springs, Colo., 130 tons, bridge and approaches, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

State of New Jersey, 400 tons, route 40, highway work; Fred McDowell, low bidder.

Flushing, N. Y., 200 tons, asphalt plant, Harper's Creek and Willetts Point Boulevard: James P. Rice Building Co., Inc., low bidder on general contract.

Dutchess County, N. Y., 115 tons, Eastern State Parkway; bids taken.

Chicago, 400 tons, sewer project for Sanitary District.

Lake County, Ind., 150 tons, bridge, North American Engineering Co., Peoria, Ill., low bidder.

Milwaukee, 135 tons, South Chase Avenue subway under C. & N. W. R. R. tracks; bids close Dec. 4.

Watertown, Wis., 200 tons, Division Street bridge; bids close Nov. 27.

Oakland, Cal., 225 tons, schedule C of Broadway low level tunnel; bids Dec. 9.

Donner Summit, Cal., 114 tons, State highway improvement; bids opened.

Sacramento, Cal., 135 tons, S Street viaduct; bids Nov. 27.

Missoula, Mont., 180 tons, journalism building for University of Montana; bids Nov. 30.

Aberdeen, Wash., 173 tons, multiple span city bridge; bids soon.

Fairbanks, Alaska, 170 tons, buildings for University of Alaska; bids soon.

Tool Steel Prices

Are Increased

Some producers of tool steel have announced price advances, effective Jan. 1, which approximate 5 per cent. The following advances are in terms of cents a pound: high speed, up 2.50c.; high chrome, up 2c.; oil hardening and special, up 1c.; extra, up 0.75c., and regular, 0.50c.



- ... Steel and pig iron prices advanced; effective at once on pig iron.
- ... Sales have gained as buyers try to anticipate rise in quotations.
- ... Ingot production up to 77 per cent and expected to go higher.

HICAGO, Nov. 24.—All finished steel prices are being marked up \$2 to \$4 a ton, effective Dec. 1, for delivery during the first quarter. Wire and rod prices are also being advanced, but the new quotations are effective for the month of December only. Pig iron prices at Chicago and Duluth were advanced \$1 a ton, effective Nov. 23, and rails are now quoted at \$39 a ton. Quotations on semi-finished steel are also \$2 up.

Though it is too early to get a measure of the effects of these moves, it is generally believed by steel producers that they will have no material effect on consumption. The pig iron story can be told by the size of order books, which show that those who usually contract have made commitments at the old price, leaving only the ordinary run of hand-to-mouth buying to take place during the next month.

The effects on all markets are ameliorated by the knowledge of buyers that the drift was to higher prices and in most of their minds it was only a matter of when the various steps were to be taken. Wage advances, the Social Security Law, and higher taxes all served to warn consumers what was ahead of them and undoubtedly many of them took all possible advantage of the clear warning. This is reflected in the steady uptrend of steel production, which has gained more than a half point to reach a shade above 77 per cent of capacity. Rail mills are going on heavier schedules, which, added to the pressure from practically all other sources, may push ingot output to a new high for the fall movement.

Pig Iron

All prices were moved up \$1 a

ton on Nov. 23 for deliveries from Chicago and Duluth furnaces. Heavy contracts at the old prices will protect many consumers for some time to come and sellers now expect only a moderate run of spot purchases. The new prices are effective for deliveries up to the end of the year. All major consumers in this district are busily engaged.

Cast Iron Pipe

Cast iron pipe producers are feeling the pinch of higher costs and a mark-up of prices is an early possibility. Sales are confined to small lots, usually carloads or smaller. The winter lull is about to set in and shipments will taper until spring prospects are in sight. The cast pipe trade expects 1937 business to exceed the 1936 volume.

Reinforcing Bars

The Museum of Science and Industry, Chicago, calling for 650 tons, has been let, and the 625 tons for the LeClaire, Iowa, dam has been placed. All other awards are small and fresh inquiries fall into the same category. Shop operations remain on the overtime basis, but backlogs are shrinking and this has been the signal for a shakedown of prices, which is disturbing to all concerned. The Sanitary District, Chicago, is near the end of its heavy work. It will need reinforcing bars, but inquiries will in all probability be issued for small tonnages.

Wire Products

New business has been flowing in freely and books are all but closed for the remainder of the year. The reinforcing mesh season is closed in so far as the northern part of the country is concerned, but mills expect some business to emanate from the South and the Southwest. Use of

welding wire is heavy, while nails continue to drag despite the improvement in residential building. Farm equipment builders are expanding operations and automobile plants are very close to or are at their fall peak. Labor troubles are a serious threat to automobile plants.

Cold-Rolled Strip

Output is at capacity and deliveries range from four weeks to eight weeks, depending upon the processing required. Miscellaneous demand is exceptionally brisk.

Rars

Shipments to all classifications of consumers are heavy and new buying points to heavier movement before the end of the month. Some of the tonnage now coming to mills is speculative, but rolling schedules are well filled to the end of the year and, unless mills are willing to ship against present prices well into the new year, there are destined to be many disappointed users. Tractor plants are holding to excellent schedules and the farm equipment group is again on the march to higher productions levels. The automobile group is still expanding releases and bar mill operators believe that requirements may grow more before a level is reached. The one cloud in the sky is the labor situation.

Rails

The tonnage noted a week ago is still overhanging the market with all purchasing arrangements made except the addition of signatures. Rail mills are producing at 50 per cent of capacity, but preliminary steps have been taken and a higher rate will be in force by the first of the new month. Miscellaneous orders for track fastenings total 4000 tons. Light rails have turned exceptionally dull.

Sheets

Average deliveries range six to eight weeks, which shows that some orders now on books will not be shipped until after the start of the new year. It is believed here that automobile manufacturers are at the peak of their fall sheet needs. The one sour note in the automobile industry is the uncertainty with regard to labor. Miscellaneous sheet business is running in high gear.

Structural Material

New awards are not heavy, but there is better tone on the basis of diversification. The Chicago & North Western is in the market for an overhead crossing and the Chicago Great Western has ordered two 70-ft. spans. Specifications from fabricators remain at a low level which may not be increased much during the winter months. Architects and engineers are fairly busy and on this fact shops look forward to an upward turn during the late winter and early spring months.

Plates

Bids will soon be taken on the Red Wing, Minn., dam, and awards are being made on the Le Claire, Iowa, dam. Railroad equipment business is fast coming to the fore. The Chesapeake & Ohio, Bessemer & Lake Erie and the Duluth, Missabe and Northern are issuing large inquiries. The Chicago & North Western is in the market for 500 hoppers and the Rock Island has ordered 350 freight cars and five streamlined trains. Milwaukee road has placed 31 locomotives and the Burlington will build 11 engines in its West Burlington shops.



Department of Water Works, Trenton, N. J., will take bids at once for extensions in pipe lines between Groveville and Yardville for water supply. Cost \$270,000, of which \$121,500 has been secured through Federal grant and remainder through municipal bond issue. Frank M. Winder is director of department. Paul Morton is city manager.

Port Byron, N. Y., will take bids soon for about 45,000 ft. of 8-in. for pipe line from Auburn, N. Y., for local water supply; also for 200,000-gal. steel tank and other waterworks installations. Financing has been arranged through Federal aid. Solomon & Keis, 267 Broadway, Troy, N. Y., are consulting engineers.

Pulaski, Va., plans about 12,000 ft. of 12-in. for auxiliary water line at Warden Spring; also new pumping station, with installation of two motor-driven centrifugal pumping units, each with capacity of 520 gal. per min., and accessory equipment. Financing is being arranged through Federal aid. Wiley & Wilson, Peoples Bank Building, Lynchburg, Va., are consulting engineers.

Lakemore, Ohio, plans pipe lines for water systems and other waterworks installation. Fund of \$110,000 is being arranged. Paul Alwell, 5005 Euclid Avenue, Cleveland, is consulting engineer.

Norris City, Ill., plans pipe lines for water system and other waterworks installation. Financing is being arranged through Federal aid. J. J. Woltmann, Unity Building, Bloomington, Ill., is consulting engineer.

Jackson, La., closes bids Dec. 4 for about 135 tons, various sizes, for water system; also for elevated tank and tower, motordriven pumping machinery and auxiliaries, and other waterworks installation. Fund of \$41,000 has been secured through Federal aid. F. P. Joseph, Glenmora, La., is consulting engineer.

Benton, La., plans pipe lines for water system and other waterworks installation. Fund of \$40,500 is being arranged through Federal aid. R. L. Tatum, Levy Building, Shreveport, La., is consulting engineer.

Eldorado, Kan., closes bids Dec. 4 for pipe for water system; also for 30,000-gal. elevated steel tank and tower, pump-

ing machinery and auxiliaries, filtration equipment and other waterworks installation. Fund of \$120,000 has been arranged through Federal aid. Paulette & Wilson, National Reserve Building, Topeka, Kan., and Farmers' Union Building, Salina, Kan., are consulting engineers.

Norwich, Kan., closes bids Dec. 3 for pipe for water system; also for elevated steel tank and tower, and other water-works installation. Fund of \$37,000 has been secured through Federal aid. Charles A. Haskins & Co., Finance Building, Kansas City, Mo., are consulting engineers.

Maquoketa, Iowa, is arranging fund of \$40,750, of which \$18,360 will be represented by Federal grant for pipe lines for water system and other waterworks installation.

Belle, Mo., will take bids Dec. 1 for a waterworks and sewer system requiring 20,740 ft. of 2 to 8-in. pipe, 27 4-in. standard fire hydrants, 9000 lb. of cast iron specials, 4000 ft. of streamlined copper tubing and 1,500,000-gal. tank and tower. George E. Wells, Inc., St. Louis, is engineer.

Nashua, Mont., closes bids Dec. 12 for pipe for water system, pumping station and other waterworks installation. Fund of \$35,000 has been arranged through Federal aid. John W. Hall, Great Falls, Mont., is consulting engineer.

Union Gap, Wash., has awarded 325 tons of 4, 6 and 8-in. to an unnamed bidder.

La Mesa, Cal., has awarded 101 tons of 4 and 6-in. pipe for use in Lemon Grove and Spring Valley Irrigation District to United States Pipe & Foundry Co.

Los Angeels will open bids Dec. 4 on 102 tons of 3, 4, 6 and 8-in. for two pumping plant projects.



... Sheet mills virtually sold up for quarter.

... Pig iron buying gains on eve of price rise.

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INCINNATI, Nov. 23.—Continued heavy sheet steel ordering the past week almost filled order books for this quarter. Mill interests indicate that this week will see schedules completed and attention can then be directed toward first quarter business. Rolling schedules in all mills are at 100 per cent, with no change expected for the remainder of the quarter. Interests in this area indicate early announcement of price advances for first quarter.

Production of ingots is being maintained at the recent peak, 32 out of 34 open hearths being in operation.

Expected price increases stimulated pig iron ordering the past week; the week's total was about 3000 tons. Both Northern and Southern iron is active in current business. Foundry operations are better.



... Missouri Pacific to buy 33,950 tons of rails.

... Pig iron buying has subsided.

States District Judge Moore has authorized the Missouri Pacific Railroad to buy 33,950 tons of rails at cost of \$1,352,192. The purchase is to be made before midnight, Nov. 30, after which, the court was informed, the mills would not accept orders at the present price of \$36.371/2 a ton and that the advance would likely be to \$40 a ton. The rails are to be laid in 1937. The court also authorized the road to advance \$210,-000 to a subsidiary, the Missouri Pacific Transportation Co., to finance the purchase of 20 buses.

Anticipating an advance in prices of finished steel, consumers in this territory continue to place orders for supplies. There apparently has been no speculative buying of heavy proportions so far. Stove manufacturers continue to buy sheets for fill-in purposes. Fencing and roofing are said to be moving in large quantities, although sales by mills to jobbers are light. Mississippi Valley Structural Steel Co. has been awarded 550 tons of structural shapes for a building for the Riberoid Co.

Buying of pig iron has subsided following a three-weeks' period of heavy buying in anticipation of higher prices. It is now believed that virtually all melters in this area have covered their require-ments for the remainder of this year. In fact, many melters have bought a sufficient tonnage to run them well into the first quarter. Shipments continue at a high rate and are in keeping with the melt. The agricultural implement industry is hitting a good stride, and by Dec. 1 production is expected to equal that of earlier in the year, which was of record proportions. Stove foundries are beginning to taper off in their output, but they will continue to operate right up to Christmas, instead of closing down on Dec. 1 as in past years, and will resume operations about the second week in January.



... New prices announced, effective Dec. 1.

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... Stainless steel order for 200 tons.

. . . District operating rate down to $54\frac{1}{2}$ per cent of capacity.

HILADELPHIA, Nov. 24.—The Carnegie-Illinois Steel Corp. has announced price increases of \$2 a ton on semi-finished material excepting skelp; \$3 a ton on carbon bars, shapes and plates; \$4 on strip steel, tin mill black plate and sheets; and an advance on standard rails over 60 lb. per yd. from \$36.375 to \$39 a ton. Effective Dec. 1, the increases are to apply to shipments of both semi-finished and finished products for the first quarter of 1937. Merchant pipe prices are unchanged.

An order for about 200 tons of stainless steel strip was placed last week by the Edward G. Budd Mfg. Co. for construction of stainless steel trains. Work of this type at hand includes two Burlington "Zephyrs," 20 cars for the Rock Island, and 48 cars for the Santa Fe. It is understood that most of the steel necessary for this work has been purchased, as is also the case with a large portion of the sheets required for the remainder of the year at least in the automobile body stamping division for models which should take until next summer for completion.

Warehouses report sales volume about up to last month's level, although in one instance both sales and inquiries have fallen off. Demand is general. Jobber sales of stainless steel are concentrated mostly among the makers of kitchen equipment and chemical apparatus, with demand for industrial uses growing heavier.

The shipping strike on the West Coast is said to be affecting some mills as tonnage intended for ports there cannot be disposed of, and additional business, which is ready to be placed, is not being sent here because of the impossibility of unloading boats. The strike situation in Eastern ports is not serious, al-

though difficulty may be had at some of the Gulf ports.

One open-hearth furnace has been taken off at Claymont, decreasing the district operating rate one-half point to $54 \frac{1}{2}$ per cent of capacity.

Pig Iron

The long expected pig iron price advance finally arrived Monday and today. Consumers are believed to have covered their requirements for this year so that the increase will not be immediately felt. The rise applies only to the remainder of this year. Spot business is fair and is in small quantities.

Sheets and Plates

Backlogs on sheets have not lessened appreciably in the past month, from two to six weeks still being required for deliveries. About the only mill where two weeks' shipment can be promised is Alan Wood's new mechanized hot mill, which is rolling light sheets. Makers of oil storage tanks are lightening their specifications with the coming of cold weather, but the demand for range boilers is taking up some of the slack. The increase of \$4 per ton on sheets was expected in most quarters, but neither jobbers nor direct buyers appeared to believe that the advance would be effective before the first of the year, as protective buying has been light. Little plate business has come out recently, but sellers steadfastly refuse to become pessimistic, looking forward to the time when rail and ship orders will again fill their books. It was incorrectly re-ported last week that Pusey & Jones, Wilmington, was low bidder on a Gulf Oil Co. barge. The low bid was made, instead, by the Pennsylvania Shipyards, Beaumont, Tex. Pusey & Jones was low, however, on the two Chesapeake & Ohio tug boats requiring 180 tons of plates each.

Wire and Wire Products

Price increases of \$3 a ton on rods, spring wire and galvanized fence wire; \$4 per ton on nails; and \$2 on bright wire and annealed fence wire were announced Monday. The advance will be effective Dec. 1 for shipment during first quarter. Orders at present prices will be taken as long as possible, while completion of all deliveries will be attempted before Jan. 15. Nail business is better than it has been for some time, but is still not good.

Shapes and Bars

Structural work in the East is on the increase this week, but few large projects have found their way into this district. A St. Clair, Pa., high school taking 350 tons of shapes was awarded to Bethlehem Steel Co., while an extension at the Philadelphia Navy Yard went to Belmont Iron Works. Inquiries are numerous and total about 5000 tons. Large structural jobs are very much lacking. Reinforcing bars are still inactive.

Imports

The following iron and steel imports were received here last week: 571 tons of pig iron from British India; 777 tons of pig iron and 252 tons of ferromanganese from the Netherlands; 25 tons of ferromanganese from Poland; 54 tons of cold drawn wire, 15 tons of steel billets, 72 tons of steel tubes, 17 tons of steel forgings and 90 tons of steel bars from Sweden.



C. & S. Pipe Line Co., Corpus Christi, Tex., recently organized as an interest of LaJita Oil Corp., Corpus Christi, plans about 45 miles of 6-in. welded steel pipe line from oil field district at Bentonville, Jim Wells County, Tex., to Corpus Christi, for crude oil transmission to bulk storage and distributing plant to be located on waterfront at last noted place. Booster pumping stations will be constructed at points along route to provide rated output of 10,000 bbl. per day. Cost close to \$400,000.

American Liberty Pipe Line Co., Dallas, Tex., has started work on 17 mile 6-in. Lindewelded pipe line from Sulphur Bluff oil field in northeast Texas to Talco, Tex.

Bennett Crude Oil Purchasing Co., Houston, Tex., is building 10-mile 6-in. Lindewelded pipe line from Kent field to Texas City, Tex.

J. W. Moore, Lubbock, Tex., is at head of project to build welded steel pipe line from gas field near Brownwood, Tex., to Llano, Tex., for natural gas transmission to latter place, where franchise is being secured.

Humble Oil & Refining Co., Humble Building, Houston, Tex., plans 4-in. welded steel pipe line from Flour Bluff oil field, Nucces County, Tex., to point near Viola, Tex., near Saxet oil field, where connection will be made with existing steel pipe line of company from Mirando, Tex., oil field to Ingleside, Tex., for crude oil transmission to oil refinery at latter place. Part of new line, where connection is made at Viola, will be 8-in.

Sinclair Oil Co., Tulsa, Okla., plans 8-in. welded steel pipe line from oil field in Love County, Okla., to vicinity of Marietta, Okla., about eight miles, for crude oil transmission.

Oklahoma Pipe Line Co., Tulsa, Okla., has awarded contracts for two new loops which are part of a current relooping program. White Deer Pipe Line Construction Co. will lay 15 miles of 8-in. pipe near Cromwell, Okla., and south, and J. R. Stewart Construction Co. will build 15 miles of 8-in. pipe from Hewitt Station north, all pipe to be Lindewelded.

Deming, N. M., has secured additional Federal grant over original appropriation of \$33,896 for steel pipe lines for municipal gas distribution and will make a number of extensions. Contract for installation has been let to J. A. Mahoney, Inc., Deming. C. B. Morgan, Deming, is consulting engineer.

St. Maries, Idaho, has rejected bids recently received for 45,250 ft. of 10, 12 and 36-in. steel pipe for main water line from intake dam at water source to municipal control station, and will ask new bids soon. Fund of \$116,363 has been secured through Federal aid for this and other water-works installation. Arthur Tiggelbeck, Sandpoint, Idaho, is consulting engineer.

Aberdeen, Wash., closed bids Nov. 18 for 54-in. steel pipe for submarine installation in Wishkah River for new industrial water system. S. C. Watkins is city water superintendent and engineer.



... Dock strike is now affecting steel trade.

... Projects held up awaiting settlement.

SAN FRANCISCO, Nov. 23.—
With many shipments held up as a result of the dock strike, now in its fourth consecutive week, activity in Pacific Coast steel markets remained generally quiet last week. Though several good-sized awards were made, few new projects were opened to bidding. Prospective builders have delayed bids until they can be assured of shipments.

Among contemplated projects for 1937 is a \$7,000,000 army air base to be built at Sacramento, Calif. Work has begun on the field itself, but construction work is not expected until the early part of next year. Oakland, Calif., has voted to cede to the Government 392 acres of land on the Eastbay

water front for a \$12,000,000 navy supply depot. Piers and buildings on this plot will cover 525,000 sq. ft.

Structural steel awards for the week aggregated 2645 tons, of which 750 tons, to be used in the construction of a plant addition for the Owens-Illinois Co. in Los Angeles, was awarded to Consolidated Steel Co. The contract for shapes involved in the construction of piers 9 and 19, totaling 820 tons was awarded to the Columbia Steel Co.

An award of 1750 tons of reinforcing steel for the University Mound Reservoir Basin in San Francisco, was made to Concrete Engineering Co. This, with a 1623-ton Bureau of Reclamation award at Laguna, Calif., to Columbia Steel Co., dominated the aggregate awards of 6413 tons of reinforcing bars during the week.

Mill production remained near capacity, but unless some sort of a settlement of the maritime strike is brought about soon, mill activity will be cut in half.

First New Blast Furnace Since 1930 To Be Built by Inland Steel Co.

NLAND STEEL CO., Chicago, will build a new blast furnace of 1000 tons daily capacity at its Indiana Harbor works, increasing the stacks at that plant to five. The contract for the engineering and construction of the furnace has been awarded to Arthur G. McKee & Co., Cleveland. The Koppers

Co. has just been awarded a contract to build 59 by-product coke ovens at the same plant.

This will be the first new blast furnace to be built in the United States since the spring of 1930, when the International Harvester Co. completed one at South Chicago.

Republic Announces Details of New Continuous Strip Mill, 90 in. Wide

LEVELAND, Nov. 24.—Plans for the construction of a new continuous sheet-strip mill in Cleveland were formally announced by the Republic Steel Corp. today. The plant will include both hot and cold mills.

The hot mill will roll strip up to 90 in. wide and will have a capacity of 60,000 to 70,000 tons a month. It will have a maximum speed of 2100 ft. of strip steel per minute. It will be supplied with three heating furnaces capable of heating approximately 150 tons of slabs per hr. The hot mill electrical equipment will consist of four 3000-hp., one 3500-hp. and five 4500-hp. motors as well as many smaller motors and four large motor generator sets.

The cold mill will consist of one three-stand tandem mill, one driven by a 1500-hp. motor and two stands by 2500-hp. motors; two single stand finishing mills of similar size, two lines of continuous pickling vats, annealing vats and other cold mill equipment.

Slabs for the hot mill will be supplied by the nearby Corrigan-McKinney plant of Republic.

The new plant will be on a 120acre site in the Cuyahoga River Valley, adjoining the Wheeling & Lake Erie and Newburgh & South Shore railroads. The plant will be housed in nine buildings arranged in two groups, one 1800 x 315 ft. and the other 900 x 350 ft. The main buildings will require 21 or more cranes in capacities from 10 to 75 tons.

Contracts for foundations, excavations, piling and so forth have been placed with the Hunkin-Conkey Construction Co., Cleveland, which will start work immediately.

Contracts for the major mill machinery have been awarded to the United Engineering & Foundry Co., Pittsburgh. The plant will represent an investment of \$15,000,000. It is expected that it will be ready for operation early next fall.

272 PWA Projects to Cost \$25,336,250

ASHINGTON, Nov. 24.—Administrator Harold L. Ickes yesterday announced Presidential approval of 272 PWA projects in 37 States estimated to cost \$25,336,250. Included among them was a grant of \$2,351,454 to the Chicago Board of Education for the construction and repairs of 20 school structures, estimated to cost \$5,225,454.



... Independent companies follow leading interest in steel price advances.

... Pig iron quotations advanced \$1 a ton at all Lake basing points.

. . . Business has expanded as buyers try to anticipate price increases.

LEVELAND, Nov. Leading independent steel makers have adopted price advances of \$2 to \$4 a ton on finished and semi-finished steel announced Monday by the Carnegie-Illinois Steel Corp. Similar advances on wire products were made at about the same time. The Republic Steel Corp. announces that it will place in effect the advances announced by U. S. Steel. The expected advance in pig iron prices has also been announced, all Northern grades being marked up \$1 a ton at all Lake ports that are basing points and at Youngstown. The Birmingham price has been similarly advanced.

Ingot output is unchanged at 78 per cent of capacity in the Cleveland-Lorain district and 74 per cent in the Youngstown district. The volume of business in finished steel has continued good and it is expected that the price advance will cause a rush by consumers to get under cover this month at present prices. The new quotations become effective Dec. 1 for the first quarter. At present it is not clear as to what extent mills will take on tonnage at present prices that they will not be able to ship until after Dec. 31. Some already have orders for about all the sheets and coldrolled strip they can ship during December and additional business that will be placed this month will not leave much tonnage in other products available for December rolling.

Principal price advances are as follows: semi-finished steel, \$2 per ton; bars, plates and shapes, \$3; sheets, except enameling, and hot and cold strip and tin mill black

plate, \$4; enameling sheets, \$3; alloy steel bars and billets, which were not raised at the time of the last price advance, \$4; bright annealed wire, \$2; galvanized and spring wire, bale ties and fence, \$3; nails, staples and barbed wire, \$4; manufacturers' wire, \$2; wire rods, \$3; tie plates, \$2; sheet steel piling, \$3; rails are advanced to \$39.

Pig Iron

A price advance of \$1 a ton on all grades was announced by some of the Lake furnaces Nov. 21, effective immediately. This establishes the price of foundry and malleable iron at \$20.50. In expectation of higher prices foundries have bought freely, some of them probably contracting for enough iron to carry them well into the first quarter. Sales dwindled the past week, indicating that practically all consumers had covered and new business probably will be almost nil at the new prices for some time. Furnaces have accumulated good backlogs. Shipments show a gain of 12 to 15 per cent over October owing largely to an increase in specifications from the motor car industry. While the \$1 a ton advance was not as much as some had predicted, there is already talk that another advance may be made next spring. This is predicted on the assumption that iron ore prices will have to be advanced next year because of increased cost due to the wage advance.

Iron Ore

Boats in the ore trade are being rapidly taken out of commission. While most shippers are practically through, a few cargoes may move in December. Shipping schedules this month were upset by bad weather conditions and the November movement will be less than some expected. However, in 20 days it passed the 3,000,000-ton mark and with whatever cargoes may be shipped in December the late movement is likely to reach 4,000,000 tons, making the total movement for the season 45,000,000 tons.

Sheets

Business has continued to come out in large volume, both from the automotive industry and from mis-With incellaneous consumers. creased production schedules. motor car manufacturers are issuing heavier releases and are crowd-Makers of ing for deliveries. refrigerators, stoves and other household equipment continue to order freely. Consumers in some fields evidently have placed considerable tonnage for stock in anticipation of the price advances. No general policy as to a deadline for making shipments at the fourth quarter prices has been announced. However, one producer will take no orders at these prices that it cannot fill by the end of January.

Bars, Plates and Shapes

Demand for steel bars has expanded, particularly from forge shops and other makers of automobile parts. New business in structural shapes is quite active Construction work has gained. Bethlehem Steel Co. has taken 600 tons for alterations for the Brewing Corp. of America, in Cleveland, and the award of a State highway bridge in Bucyrus, requiring 450 tons, has been made to the Burger Iron Co. The State Highway Department has asked for bids for two new grade crossing projects requiring 1200 tons and plans are out for an extension for the Cleveland Twist Drill Co. requiring 500 tons.

Strip Steel

A large volume of business was placed during the week, principally in hot rolled strip by non-integrated cold rolling plants, which evidently are building up heavy stocks before price advances become effective. Deliveries still range from two to three weeks. Several of the cold strip mills have withdrawn from the market, being sold up for the remainder of the quarter.

Bolts, Nuts and Rivets

New demand is very active, the volume of business being at a higher peak than at any time since 1929. Automobile manufacturers are ordering heavily and business

is good from practically all classes of consumers and jobbers. Some of the increased business is attributable to the possibility of higher prices. With an advance in steel prices, makers expect shortly to name higher prices for the first quarter. Demand for rivets shows some improvement, principally from railroads.



... Blast furnace operation highest since July, 1930

... Pig iron buying wave precedes price advance

DIRMINGHAM, Nov. 24.—Two additional blast furnaces are to be blown in this week, raising the district's total to 15, the highest since July, 1930. Tennessee Coal, Iron & Railroad Co. will blow in Ensley No. 6 on recarburizing iron and Sloss-Sheffield Steel & Iron Co. will put on No. 3 furnace at North Birmingham on foundry iron. The Tennessee company will then have seven out of eight furnaces in operation and Sloss-Sheffield, three out of four. The North Birmingham plant of Sloss-Sheffield has been shut down since December, 1930.

Production of merchant iron is close to normal capacity. Woodward Iron Co. is operating all three of its Woodward stacks and Republic Steel both of its usable furnaces. Woodward Iron has two small furnaces at Vanderbilt, which are shut down, but these are rarely operated. Sloss-Sheffield has another furnace at North Birmingham, which remains idle.

Lately there has been another wave of pig iron buying, in anticipation of a price advance. At the beginning of the quarter, foundries made liberal commitments for current requirements. Now they are buying for future requirements. A greater part will go into stocks for melting during the early part of 1937. As a result of the two buying movements, the furnaces are heavily booked. Shipments this month and in December will be unusually large.

Furnace companies now indicate that a price announcement may be expected at any time. This may come before the end of the week. It now looks as if the increase will be \$1 a ton, although consideration has been given to a

raise of \$1.50 and even \$2. The new price will become effective immediately, so it is stated.

Three new rail orders were announced last week, bringing the total of announced rail orders up to nearly 120,000 tons. Illinois Central bought 5000 tons; Western of Alabama, 1000 tons; Cotton Belt, 500 tons.

Steel buying continues to maintain a strong trend in all lines. Plates, bars, shapes, sheets and wire products are all in active demand. November bookings will not be as large as those in October, on account of the larger amount of rails bought last month. However, in general lines, new tonnage will be almost as good.



... British contracts for munitions aid Dominion.

... Airplane orders also have been received.

ORONTO, Ont., Nov. 24.-Munitions contracts placed by the British Government are having a stimulating effect on operations in the Canadian iron and steel industry, and it is understood that other large orders will be placed at an early date. Airplane orders also have been received and prospects for greatly increased business in export markets are shaping up. Canadian railroads are said to be considering equipment purchases. The mining industry continues to furnish a good demand for steel and machinery and there are some good orders reported from the automotive industry. Building trades are showing more activity and there has been a minor pick-up in structural steel demand. The outlook for new business in the Canadian iron and steel markets is quite bright, and Canadian steel interests look for general improvement in 1937 over that for the current year.

In the merchant pig iron markets demand is holding at a steady level, with inquiries increasing for spot delivery and indications of more extensive purchasing for first quarter. Sales for the week ranged from 1200 to 1400 tons made up of lots from a car to 400 tons. Imports are small. Prices are firm and unchanged.

Scrap dealers in Toronto and Montreal state that inquiries are increasing. Shipments of heavy melting steel and turnings to mills in the Hamilton district are running at the peak for the year, while other consumers in Ontario and Quebec also are showing good interest in the market. Prices are unchanged, but the tone is stronger.



... Premiums offered for pig iron.

... Little steel available for export.

ONDON, Nov. 24 (By Cable).—
Pig iron remains very tight and consumers are obliged to accept almost any grade of iron that makers can supply. Premiums are being offered, but makers show little inclination to sell. The outlook is slightly improved by the imminent starting up of two or three furnaces.

There is a marked improvement in the export demand for steel, but satisfaction of home needs leaves little surplus for export. The president of the Board of Trade recently warned iron and steel makers against the widespread neglect of export markets, which may have a serious effect when the domestic boom dies down. Meanwhile, further acceleration of home demand is expected, so that, despite increased production, no material relief in the supply shortage is likely. Semi-finished steel scarcity is somewhat relieved by larger imports, but deliveries of finished steel, especially constructional material, is far behindhand.

There is good home and export buying of tin plate and premiums of 6p. and 1s. are being paid. Unfilled orders reached 5,000,000 base boxes.

There is a widespread export demand in the Continental iron and steel market.

The international meeting of tubemakers reached no definite decision regarding resuscitation of the International Cartel. However, there will probably be another meeting early next year.

The changes in Continental gold export prices have been confirmed. British prices are unchanged.



... Flurry of buying attends price announcements.

... No change in pipe price expected.

. . Nov. 30 deadline for protective orders.

EW YORK, Nov. 24.—The Carnegie-Illinois Steel Corp. has announced new prices for steel products for delivery in the first quarter. On all orders placed after Dec. 1, semi-finished steel is up \$2 a ton; bars, plates and shapes will be \$3 higher; an increase of \$4 will apply on strip and sheets, with the exception of vitreous enameling stock (which is up \$3), and the price of standard rails will be advanced from \$36.375 to \$39 a ton.

So far Carnegie-Illinois is the only seller to release price advances, but similar action by other leading producers is expected momentarily. Although a strict Dec. 31 deadline on shipments at current price levels was expected, the announcement that protective orders would be taken until Nov. 30 apparently precludes such action to some extent. Rolling backlogs are already quite heavy, and the volume of current bookings is such as to result in some carryover at the year's end.

Two important products are not included in the price advances. These are tin plate and pipe. A week ago the published price of tin plate was reduced from \$5.25 to \$4.85 per base box, Pittsburgh, but this actually results in no important change, as the \$5.25 price was subject to a discount of 71/2 per cent, making a net price of \$4.86. This discount will be discontinued as of Dec. 31. There was also a discount of 71/2 per cent on light coated manufacturing ternes, which resulted in a net price of \$3.9775 per base box; under the new set-up the price becomes \$4.15 per base box, no dis-

No change in the price in pipe is expected because of the unsettled conditions that have prevailed in the resale markets, particularly in New York. It is felt that it would be difficult to establish a higher price level on pipe so long as the chaotic resale conditions exist, and they have existed for years, even under the operation of the steel code.

Most district offices here report a sizable bulge in new bookings and inquiry, much of which is considered anticipatory in nature. All outlets are represented in the buying.

The structural steel market which has long lagged behind other grades, has yet failed to show an additional seasonal decline. Small private work is maturing in good volume here and the future is promising on the strength of several larger projects now under consideration. The week's awards of shapes included 2375 tons for a garage on 56th Street and 925 tons for a Brooklyn brew house. Bethlehem Fabricators, Inc., will supply the former tonnage and Ingalls Iron Works was awarded the latter.

The rising tide of business has developed a rather acute situation in stainless steel wherein some producers are virtually forced to allocate tonnage, as they cannot supply all of the demands upon them.

The Board of Transportation, City of New York, will receive bids until Dec. 11 for from 110 to 250 passenger cars for subway service.

Pig Iron

Eastern Pennsylvania producers raised the price \$1 a ton today to take effect immediately. This announcement was preceded by similar action at Pittsburgh and Great Lakes producing centers and by a mark-up at Buffalo Monday. An immediate advance of \$1 a ton in low phosphorus iron has also

taken place, making the base price at Standish, N. Y., \$25 a ton instead of \$24. Except for a \$1 a ton increase, effective Nov. 4, by the Mystic stack at Everett, Mass., pig iron quotations haven't been changed since approximately a year ago, when there was a general upward revision of \$1 a ton. With the current advance taking effect immediately, it is expected that an additional increase will later be announced which will apply to first quarter delivery.

Reinforcing Steel

Although the announcement of first quarter prices by the Carnegie-Illinois Steel Corp. made no mention of reinforcing bars, it is expected that mill prices of this commodity will be advanced for shipment after Dec. 31. If so, highresale prices are also likely. Meanwhile, the resale price situation has been showing some improvement. A moderate amount of business is being done in this area, but the market could not be called active. Projects on which bids have recently been taken include a New Jersey highway project, calling for 400 tons of bars, and an asphalt plant at Flushing, N. Y., requiring 200 tons.



Bessemer & Lake Erie is inquiring for 1000 90-ton hopper cars, 500 70-ton hopper cars and 500 50-ton mill-type gondola cars.

Union Railroad Co. is inquiring for 900 70-ton mill-type gondola cars.

Western Maryland is inquiring for 10 locomotives of 2-6-6-4 type.

Delaware, Lackawanna & Western will buy five 4-6-4 type passenger locomotives.

Chicago, Burlington & Quincy will build 11 locomotives at its West Burlington shops at a cost of more than \$1,000,000. Of these 10 will be for freight or passenger service and one will be a streamlined steam locomotive.

Milwaukee Road has ordered 30 freight locomotives from Baldwin Locomotive Works, and one streamlined passenger locomotive of the Hiawatha type from American Locomotive Co.

The Virginian is inquiring for 25 50-ton automobile box cars.

Duluth, Missabe & Northern is inquiring for 250, 500 or 1000 ore cars and 50 hopper cars, all 75 tons' capacity.

Chesapeake & Ohio is considering purchase of 50 50-ton stock cars, 25 70-ton dry bulk cars and 50 caboose cars in addition to its inquiry for 2000 freight cars.

Board of Transportation, City of New York, will receive bids until Dec. 11 for 110 to 250 passenger cars for subway service.

Rock Island has ordered 350 freight cars from American Car & Foundry Co.

and five streamlined trains from Edward G. Budd Mfg. Co.

Missouri Pacific has been authorized to advance \$210,000 to Missouri Pacific Transportation Co., a subsidiary, to finance purchase of 20 new buses.

Chicago & North Western will purchase 500 hopper cars.

Gulf, Mobile & Northern plans the purchase of 400 freight cars, one passenger motor car and two passenger cars for \$1,180,500.

St. Louis Southwestern has been authorized to spend \$1,825,715 in cash as fol-

lows: Boilers, frames and other parts with which to assemble five locomotives of 4-8-4 type at Pine Bluff, Ark., \$550,000; 10 air-conditioned passenger coaches, \$500,000; tie plates and rail anchors, \$81,330; applying steel sides and auto doors to 100 box cars, \$131,065. Bondholders objected to use of cash for the betterments. Judge Davis previously had granted authorty for the road to spend \$123,500 for heavy duty machinery.

RAILS AND TRACK SUPPLIES

Cotton Belt Line has purchased 500 tons of rails from Tennessee Coal, Iron & Railroad Co.

Western Railway of Alabama has placed 1000 tons of rails with Tennessee Coal, Iron & Railroad Co.

Illinois Central has bought 5000 tons of rails from Tennessee Coal, Iron & Railroad Co.

Missouri Pacific has been authorized to expend \$1,352,192 for 33,950 tons of rails to be laid in 1937. The purchase is to be made before Nov. 30 midnight, after which, it was informed, mills would not accept orders at the present price.



... Steel mill operations remain steady.

DUFFALO, Nov. 24.—Bethlehem's Lackawanna plant continues to operate 22 to 23 open hearths; Republic Steel Corp., 7, and Wickwire-Spencer Steel Co., 2.

Structural fabricators report activity in small tonnages. One Buffalo concern has the contract for 125 tons for an addition to the National Aniline & Chemical Co. plant, Buffalo. The 300 tons involved in the sewage disposal plant main building is interesting fabricators. State buildings of varying tonnage in Ithaca, Hornell, Mt. Morris, Geneseo and Utica will be bid on soon.

U. S. Steel Declares \$7 on Preferred

DIRECTORS of the United States Steel Corp. on Tuesday declared a dividend of \$7 a share on the preferred stock on account of arrearages in the cumulative dividend on the stock. The dividend is payable Dec. 24, 1936, to stock of record Dec. 1. This payment reduces the arrearages on the preferred to \$9.25 per share.

Until last quarter arrearages on the corporation's preferred issue have been piling up since the final quarter of 1932, when the regular 1% per cent dividend was reduced to ½ percent. This payment was continued throughout 1933, 1934, 1935, and the first quarter of this year. In the second quarter of this year, however, the 50c. payment was increased to \$1, and then in the third quarter \$2 was paid on the arrears in addition to the resumption of the regular \$1.75 dividend payment.

Carnegie-Illinois Announces First Quarter Prices

N Tuesday, Nov. 24, the Carnegie-Illinois Steel Corp. released the following delivered prices on flat-rolled products, rails and track supplies, bars, plates, shapes, piling and semi-finished steel. These prices will be effective Dec. 1 and will apply on all sales for first quarter shipment.

Rerolling billets, blooms and slabs, Pittsburgh or Youngstown	
Rerolling billets, blooms and slabs, Chicago or Gary	
Rerolling billets only, Duluth	
Sheet bars, Pittsburgh	
Sheet bars, Chicago	34.60 per gross ton
Forging blooms, billets and slabs, Pittsburgh	40.50 per gross ton
Forging blooms, billets and slabs, Chicago or Gary	40.60 per gross ton
Forging billets only, Duluth	42.50 per gross ton
Hot-rolled carbon-steel bars and small shapes, Pittsburgh	2.225 per 100 lb.
Hot-rolled carbon-steel bars and small shapes, Chicago or Gary	2.280 per 100 lb.
Hot-rolled carbon-steel bars and small shapes, Duluth	2.375 per 100 lb.
Hot-rolled alloy-steel bars, Pittsburgh	2.775 per 100 lb.
Hot-rolled alloy-steel bars, Chicago	2.780 per 100 lb.
Hot-rolled alloy-steel billets, blooms and slabs, Pittsburgh	55.50 per gross ton
Hot-rolled alloy-steel billets, blooms and slabs, Chicago	55.60 per gross ton
Hot-rolled steel strip, Pittsburgh	2.175 per 100 lb.
Hot-rolled steel strip, Chicago or Gary	2.280 per 100 lb.
Hot-rolled carbon-steel structural shapes, Pittsburgh	2.075 per 100 lb.
Hot-rolled carbon-steel structural shapes, Chicago	2.130 per 100 lb.
Hot-rolled carbon-steel plates, Pittsburgh	2.075 per 100 lb.
Hot-rolled carbon-steel plates, Chicago	2.130 per 100 lb.
Hot-rolled sheets, Pittsburgh (10 gage base)	2.175 per 100 lb.
Hot-rolled sheets, Chicago or Gary (10 gage base)	
Hot-rolled annealed sheets, Pittsburgh (24 gage base)	
Hot-rolled annealed sheets, Chicago or Gary (24 gage base)	
Cold-rolled sheets:	
Primes with seconds arising, Pittsburgh (10 gage base)	2.825 per 100 lb.
Primes with seconds arising, Pritsburgh (10 gage base)	2.930 per 100 lb.
Primes with seconds arising, Chicago of Gary (10 gage base)	3.275 per 100 lb.
Primes with seconds arising, Pittsburgh (20 gage base)	3.380 per 100 lb.
American Vitrenamel, Pittsburgh (10 gage base)	2.625 per 100 lb.
American Vitrenamel, Chicago or Gary (10 gage base)	2.730 per 100 lb.
American Vitrenamel, Pittsburgh (20 gage base)	3.225 per 100 lb.
American Vitrenamel, Chicago or Gary (20 gage base)	
	3.330 per 100 lb.
U. S. electrical sheets, Pittsburgh	4.075 per 100 lb.
Galvanized sheets, Pittsburgh (24 gage base)	3.425 per 100 lb.
Galvanized sheets, Chicago or Gary (24 gage base)	3.530 per 100 lb.
Galvanized corrugated 26 in. wide after standard 21/2-in. corrugations:	
Pittsburgh (24 gage base)	4.340 per square
Chicago or Gary (24 gage base)	4.460 per square
Long ternes, unassorted, Pittsburgh (24 gage base)	3.725 per 100 lb.
Long ternes unassorted, Chicago or Gary (24 gage base)	3.830 per 100 lb.
Tin mill black plate (28 gage base):	
Hot-rolled and annealed, Pittsburgh	2.975 per 100 lb.
Hot-rolled and annealed, Chicago or Gary	3.080 per 100 lb.
U. S. S. sheet piling, Pittsburgh	2.425 per 100 lb.
U. S. S. sheet piling, Chicago	2.530 per 100 lb.
U. S. S. zee piling, Pittsburgh	2.525 per 100 lb.
U. S. S. zee piling, Chicago	2.630 per 100 lb.
Standard rails, over 60 lb. per lineal yard, shipping mill	
Angle splice bars, shipping mill	2.70 per 100 lb.
Tie plates, Pittsburgh	
Tie plates, Chicago	
	The same and a

... World copper stocks decline 23,200 tons.

... Domestic lead shipments exceeded 59,000 tons last month.

. . . Spot tin scarce due to shipping strike; zinc quiet.

EW YORK, Sept. 24. — The copper statistics for October contained all the bullish elements expected of them. Total world refined stocks underwent a reduction of 23,200 tons, of which 10,700 tons applied to domestic reserves and 12,500 tons to foreign

an increase in world refined output 500 tons for the world as a whole while consumption in this country,

stocks. This was effected despite

of approximately 14,900 tons, of which 10,200 tons was domestic. Apparent consumption, as based on shipments, expanded by some 12,-

The Week's Prices. Cents Per Pound for Early Delivery

	Nov. 18	Nov. 19	Nov. 20	Nov. 21	Nov. 23	Nov. 24
Electrolytic copper, Conn.*	10.00	10.00	10.50	10.50	10.50	10.50
Lake copper, N. Y				10.62 1/2	10.62 1/2	10.62 1/2
Straits tin, Spot, New York	51.37 1/2	51.37 1/2	51.12 1/2		51.00	52.00
Zinc, East St. Louis	5.05	5.05	5.05	5.05	5.05	5.05
Zinc, New York†	5.42 1/2	5.42 1/2	5.42 1/2	5.42 1/2	5.42 1/2	5.42 1/2
Lead, St. Louis	5.05	5.05	5.05	5.05	5.05	5.05
Lead, New York	5.20	5.20	5.20	5.20	5.20	5.20

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
† Includes emergency freight charge.
Aluminum, virgin 99 per cent plus 19.00c.-21.00c. a lb. delivered.
Aluminum, No. 12 remelt No. 2 standard, in carloads, 16.75c a lb. delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 12.50c. a lb., New York.
Quicksilver, \$88.50 to \$92.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 10.75c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse Delivered Prices, Base per Lb

Tin, Straits pig 53.50c. to Tin, bar 55.50c. to Copper, Lake 11.50c. to Copper, electrolytic 11.50c. to Copper, castings 10.75c. to "Copper sheets, hot-	56.50c. 12.50c. 12.50c.
	17.75c. 15.87½c.
	18.12 ½ c.
*Brass rods 5.75c. to Zinc, slabs 5.75c. to Zinc, sheets (No. 9),	18.25c. 13.87½c. 6.75c.
Lead, American pig. 5.75c. to Lead, bar 6.75c. to Lead, Sheets, cut Antimony, Asiatic13.00c. to	7.75c. 8.75c.
Alum., No. 1 for re-	23.30c.
melting, 98 to 99 per cent18.50c. to Solder, ½ and ½31.00c. to Babbitt metal, com- mercial grades25.00c. to	32.00c.
more brades as. oc. to	00.000.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33½ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb. Tin, Straits pig......55.75c.

Tin. Bar
Copper, Lake 11.50c. to 11.75c.
Copper, electrolytic. 11.50c. to 11.75c.
Copper, castings11.25c. to 11.50c.
Zinc, slabs 6.50c. to 6.75c.
Lead, American pig. 5.90c. to 6.10c.
Lead, bar 8.50c.
Antimony, Asiatic 15.00c
Babbitt metal, medium grade.20.25c.
Babbitt metal, high grade60.75c.
Solder 16 and 16

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal).

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. cruci- ble	7.75c.	8.50c.
Copper, hvy. and wire	7.62 1/2 c.	8.12 ½ c.
Copper, light and bottoms	7.12 1/2 c.	7.62 1/2 c.
Brass, heavy	4.75c.	5.37 1/2 C.
Brass, light	4.00c.	4.75c.
Hvy. machine com- position No. 1 yel, brass	6.75c.	7.25c.
turnings	5.75c.	6.25c.
No. 1 red brass or		
compos. turnings	6.37 ½ c.	6.87 1/2 C.
Lead, heavy		4.37 %c.
Sheet aluminum	13.25c.	
Zinc	2.50c.	2.87 %c.
Cast aluminum	12.12 1/2 c.	13.25c.

at 75,900 tons, showed little change from September's high rating. Since release of this information to the trade, the feature of the copper market has been the appreciable rise in export prices, accompanying a resumption of good demand. The export level today is about 10.77½c., c. i. f. European ports. Domestic sales continue quiet, with the price firm and unchanged at 10.50c., Valley. Bookings yesterday were 436 tons, the month's total now being 85,820 tons.

Lead

October refined lead statistics lived up to predictions that the month would be unusual, shipments having risen 8525 tons to 59,210 tons and stocks having declined 17,-087 tons to a total of 200,517 tons at Nov. 1. Production expanded 9174 tons to 42,156 tons. The domestic market continued busy last week, with buying strong in certain directions, but with a tendency to moderate in others. Prices are unchanged at 5.20c. a lb., New York.

Zinc

Demand was moderate to fair last week, with sales of roughly 6000 tons and shipments 1000 tons or so less. The higher price basis of 5.05c. a lb., East St. Louis, announced on Nov. 16, was not rigidly adhered to, and approximately half of last week's turnover was accordingly negotiated at the 4.95c. level. Currently, however, the market, based on 5.05c., is firm in all direc-Producers are showing no tions. inclination to press for business owing to heavy order backlogs. Quiet trading should characterize the period ahead, at least until deliveries effect a reduction in accumulated bookings or some other eventuality changes the present set-up.

Trading is this market remained fairly quiet for the most part of the week, but commencing yesterday demand for spot supplies was aggravated by existence of the shipping strike. Arrival of 400 tons of tin aboard an American steamer here encountered strikers' opposition and was not unloaded. This has caused an acute shortage in spot tin at New York, and at the moment dealers and importers have practically no metal to offer. The spot Straits quotation at New York has accordingly moved higher since the week opened, rising to 52c. a lb. today from a level 1c. lower yesterday, the latter quotation representing bottom for the week in a previously declining price trend. Cable reports advise the official London quotation for standard spot this morning was £232 15s., while futures were £232 5s. The Eastern price was £232 17s. 6d.



IRON AND STEEL SCRAP

. . . Composite unchanged at \$16.17 a gross ton.

. . . Principal markets develop a stronger undertone.

. . . Sellers believe advances are due.

LTHOUGH steel making grades are showing some weakness in the Detroit area owing to the heavy scrap output of automobile plants, all other markets report a strengthening under-There has been remarkably little buying in any area during the past month and consequently mill stocks on the average are not large. This factor, together with the certainty that mill operations will be maintained at near the present levels for several months, tends to enhance the outlook for sellers. The \$1 advance on all pig iron sales after Dec. 1 likewise is a factor which will permit sellers of scrap to seek higher bids for their holdings.

No important price changes occurred during the week, and for the second consecutive seven-day period the composite price is maintained at \$16.17 a gross ton, which is 58c, under the peak level established during the period Sept. 22 to Oct. 6.

The high prices in effect in the domestic market have discouraged most foreign buyers. Old contracts are almost liquidated. Leading buyers, such as Japan, England and Italy, are finding it more economical to seek supplies elsewhere in the world, and they are not expected back in this market in a large way until prices fall off from \$1 to \$2 a ton.

Pittsburgh

No. 1 steel is still nominally quotable at \$17 to \$17.50, although in the past week the market has shown a stronger undertone. The quietness prevalent during the last month has enabled most dealers in this district to clean up on their shortages. Brokers are picking up small tonnages at \$17, but it is thought that heavier tonnages would bring a higher figure. In view

of the distinct possibility of increased operating rates and the sustained absence from the market of large consumers, it is likely that the next sale of No. 1 steel will bring \$17.50 or better.

Chicago

Differences of opinion as to prices for the heavy tonnage grades are holding this market at a standstill. are standing more or less pat with offers of \$16.50 a gross ton for heavy melting steel, while brokers pay about that amount to dealers. The railroads still get only a few cents under \$17. Demand and supply are well balanced. In fact, the adjustment is so fine that a sharp blast of winter weather could so cut shipments that prices might readily bound upward. The specialty market is strong, with practically all offerings being taken as presented.

Cleveland

The market appears firm, but there have been no consumer purchases for some time and prices are untested and unchanged. Supplies are more plentiful owing to increased operations of some of the industries that produce scrap, and brokers find it easier to buy at prevailing quotations. Heavy shipments are reaching Cleveland mills by water and may continue a week or two longer. When navigation closes these consumers will have very large stocks. Scrap has been going into the Valley district in such volume that there has been some hold-up of shipments.

Philadelphia

The market here last week was quiet. Present prices are not bringing out any sizable quantities of material, and sellers are looking for an advance soon. No 1 steel is quoted at \$14.50 to \$15, the lower limit being established by Bethlehem purchases at \$14.50. Brokers are anticipating a higher market. District mills report their scrap piles are of fair size.

Buffalo

A sizable purchase of stove plate here at \$13.50 was the most interesting transaction of the week. The only other sales of consequence were the purchases by the largest consumer of 3000 to 4000 tons of No. 1, No. 2 steel and allied grades on the basis of \$16 for the No. 1 and \$14.50 for the No. 2, Dealers are actively in the market for stove plate and cupola cast scrap.

Boston

Worcester continues to buy some scrap, especially No. 1 steel and some skeleton, with the price a shade firmer for the latter. Pittsburgh has taken a little tonnage, but demand seems to have eased off in the past week or so. However, the demands from Pittsburgh are expected to gain pace over the next month.

New York

Prices paid for scrap in this vicinity are unchanged from a week ago. With competitive material, such as pig iron, advancing, however, the undertone is stronger. Mills still aren't buying in quantity, though brokers and dealers hereabout think demand will be stimulated by actual needs before very long. Scrap is coming out less freely than before quotations began to recede about a month ago. Advent of cold weather may act to restrict the flow of supplies.

Detroit

This market is definitely softer and principal grades have eased off 25c. to 50c. a ton. The principal consumer in this area bought a sizable quantity, chiefly hydraulic bundles, at a price 50c. below the market of last week.

As automobile plants swing into peak production there is a tremendous amount of scrap coming out at the present time, which will have a further tendency to weaken prices even though there are strengthening influences such as the close of the shipping season and the addition of rail tariffs to out of town shipments. The Union League Club, Wayne Street, is being scrapped by Woodmere Scrap Iron & Metal Co., and will yield about 2200 tons of steel.

St. Louis

Prices advanced during the week from 25c. to 50c. a ton on some items. While no sales were made, dealers report that many large inquiries are pending. The Missouri Pacific Railway has issued a list of 70 carloads, of which 30 carloads are rails. Supplies are reported to be getting lower and offerings lighter.

Cincinnati

Activity in the steel market is reflected in a stronger undertone for scrap. Sales are not large since mills refuse heavy commitments without concessions from present price levels. Foundry purchases of short rails and malleable grades are active. Dealers' bids are steady and material is closely held in yards.

Iron

PITTSBURG	Н
Per gras ton delivered No. 1 hvy. mltng. steel. \$ No. 2 hvy. mltng. steel. \$ No. 2 hvy. mltng. steel. \$ No. 2 RR. wrought Scrap rails Rails, 3 ft. and under. Comp. sheet steel Hand. bundled sheets. Hvy. steel axle turn. Machine shop turn. Short shov. turn. Mixed bor. & turn. Cast iron borings Cast iron carwheels. Hvy. breakable cast. No. 1 cast RR. knuckles & cpirs. RRil coll & leaf springs Rolled steel wheels Low phos. billet crops. Low phos. blar. Low phos. punchings. Low phos. plate scrap. Steel car axles	to consumer: 117.00 to \$17.50 to \$17.50 to \$18.00 to \$17.50 to \$16.00 to \$16.50 to \$16.00 to \$12.50 to \$12.00 to \$12.50 to \$12.00 to \$12.50 to \$13.00 to \$17.50 to \$18.00 to \$18.50 to \$18.50 to \$18.00 to \$18.50 to \$18.00 to \$18.50 to \$18.00 to \$18.50 to \$18
Per gross ton delivered	to consumer:
Per gross ton delivered No. 1 hvy. mitng. steel. No. 2 hvy. mitng. steel. Comp. sheet steel Light bund. stampings Drop forge flashings. Machine shop turn. Short shov. turn. No. 1 busheling Steel axle turnings. Low phos. billet crops Cast iron borings Mixed bor. & turn. No. 2 busheling No. 2 busheling Railroad grate bars. Stove plate Rails under 3 ft. Rails under 3 ft. Rails for rolling Railroad malleable Cast iron carwheels	\$15.50 to \$16.00 14.50 to 15.00 15.00 to 15.50 11.50 to 12.00 14.50 to 15.00 10.50 to 11.00 11.00 to 11.50 14.50 to 12.50 12.00 to 12.50 12.00 to 12.50 11.00 to 11.50 11.00 to 15.50
Cast iron carwheels	17.75 to 18.00
PHILADELPH	IA
Prilladelia Prilla	8.50 to 9.00 8.00 to 8.50 12.50 to 13.00 19.50 to 20.00 19.50 to 20.00 20.50 to 21.00 20.50 to 21.00 20.50 to 21.00 16.00 to 16.50 13.50 to 14.00 14.00 to 14.50 14.50 to 15.00 10.50 to 13.00
CHICAGO	-
Delivered to Chicago distribution. Hvy. mltng. steel	Per Gross Ton \$16.25 to \$16.75 \$14.00 to \$14.50 \$15.00 to \$15.50 \$15.00 to \$15.50 \$15.00 to \$15.50 \$13.50 to \$14.00 \$14.75 to \$15.25 \$18.00 to \$18.50 \$17.50 to \$18.00 \$17.50 to \$18.00 \$15.00 to \$15.50 \$18.00 to \$15.50 \$18.00 to \$15.50 \$19.00 to \$15.50 \$19.00 to \$16.50 \$18.75 to \$19.25 \$18.75 to \$19.25 \$18.75 to \$19.25 \$18.75 to \$19.25 \$18.75 to \$10.00 \$10.50 to \$10.00 \$10.00 to \$10.00 to \$10.00 \$10.00 to \$10.00 to \$10.00 to \$10.00 to \$10.00 to \$10.00 to \$10.00
Iron car axles	\$18.50 to \$19.00
oteon car axios	11.10 10 10.20

and	Steel	Scrap	Price
Pipes and No. 1 mac Clean auto No. 1 rail No. 1 agri Stove plat Grate bars	wrought. wrought. neling, old. e tires flues . cast. road cast. e	13.00 to 8.50 to 14.00 to 13.00 to 13.50 to 11.00 to 8.75 to 9.50 to	9.00 14.50 13.50 14.00 11.50 9.25 10.00
	BUFFAI		
No. 1 hvy. No. 2 hvy. No. 2 hvy. Scrap rall New hy. b Old hydra Drop forge No. 1 busl Hvy. axle Machine Knuckles Coil & lea Rolled ste Low phos. Short sho Mixed bor Cast iron No. 2 bus	ton, f.o.b. of mitng, stee mitng, stee so indied sheul. bundles fishings eling turnings. shop turn. & coupler f springs. el wheels. billet crop v. turnings heling axles	el.\$1.6.00 to 16.00 to 16.00 to 13.00 to 13.00 to 14.50 to 14.50 to 14.50 to 14.55 to 10.55 to 9.50 to 18.50 to 18.50 to 18.50 to 10.00 to 10.00 to 10.00 to	\$16.50 15.00 16.50 15.00 13.50 15.00 11.00 10.00 19.00 19.00 19.00 19.00 19.00 19.50 10.50 10.50
	BIRMING		
Scrap Stes Short sho Short sho Stove plat Steel axle Iron axles No. 1 RR. Rails for No. 1 cast Tramcar Dealer's bu Il Selected 1 No. 1 hvy No. 2 hvy No. 1 locol Misc. star Railroad s Bundled s No. 2 RR. No. 1 bus Cast bor. Rails for	wrought the ling steel v. turning e wrought. s wrought. rolling rices wheels wheels melting. motive tires d. sec. ra prings heets wrought theling & turn rolling shop turn nings axles xxles xxles wrought s under 3 fe be bars.	JIS per gross nsumer: .\$15.25 to 14.50 to 14.50 to 13.25 to 15.00 to 8.50 to	\$13.00 13.00 8.00 8.50 15.00 15.00 14.00 13.50 13.00 ton de- \$15.75 15.00 13.75 14.00 17.25 16.00 17.25 9.00 17.25
Cast iron No. 1 ma Railroad r No. 1 rail Stove pla Agricul. r Grate bar Brake sho Dealers' No. 1 hvy.	i under 3 f le bars carwheels chinery ca nalleable road cast. te carwheels chinery cast. te carwheels chinery cast. te carwheels chinery price mitng, ste ls for mitnet clipping et clipping	14.00 tc st. 12.50 tc 15.50 tc 7.50 tc 7.50 tc 9.00 tc 11.25 tc NATI s per gross el.\$14.00 tc	14.50 13.00 16.00 13.00 13.00 13.00 9.50 11.75 ton: \$14.50 12.00 14.50
Bundled s Cast iron Machine s No. 1 bus No. 2 bus Rails for No. 1 loco Short rail Cast iron No. 1 mac No. 1 rail Burnt cas Stove plai	heets borings hop turn heling heling motive tires carwheels hinery cas iroad cast .t he malleable	10.50 tc 6.50 tc 7.50 tc 11.00 tc 6.50 tc 15.00 tc s 12.50 tc 17.00 tc 13.50 tc 13.50 tc 13.50 tc 13.50 tc 9.50 tc	11.00 7.00 8.00 11.50 7.00 15.50 13.00 17.50 14.00 14.50

DETROIT
Dealers' buying prices per gross ton: No. 1 hvy. mltng. steel. \$12.50 to \$13.00 No. 2 hvy. mltng. steel. \$12.50 to \$13.00 Borings and turnings. \$.75 to \$.25 Long turnings. \$.25 to \$.75 Long turnings. \$.25 to \$.75 to \$.75 Long turnings. \$.25 to \$.75 to \$.75 to \$.75 Long turnings. \$.25 to \$.75 to \$.
CANADA
Dealers' buying prices per gross ton: Mon- Toronto
YOUNGSTOWN Per gross ton delivered to consumer: No. 1 hvy. mltng. steel. \$16.75 to \$17.25 Hydraulic bundles 16.00 to 16.50
Machine shop turn 12.00 to 12.50
NEW YORK
Dealers' buying prices per gross ton: No. 1 hvy. mltng. steel. \$11.00 to \$11.75 No. 2 hvy. mltng steel. 9.50 to 10.00 Hvy. breakable cast 10.50 to 11.00 No. 1 machinery cast. 11.50 to 11.75 No. 2 cast 10.50 to 10.75 Stove plate 9.00 Steel car axles 16.00 to 17.00 Shafting 15.00 to 16.00 No. 1 RR. wrought 12.00 to 12.50 No. 1 Rrought long 11.00 to 11.50 Spec. iron & steel pipe 10.50 to 11.00 Forge fire 8.00 to 8.50 Rails for rolling 11.50 to 12.00 Short shov. turnings. 5.00 to 5.50 Machine shop turn 5.00 to 5.50 Machine shop turn 5.00 to 5.50 Cast borings 5.00 to 5.50 No. 1 blast furnace 4.50 to 5.50 No. 1 blast furnace 4.50 to 5.50 Per gross ton, delivered local foundries: No. 1 machn. cast \$14.00 to \$14.50 No. 1 hvy. cast cupola. 11.50 to 12.00 No. 2 cast 10.50 to 11.00 Add 25c. to 50c. to above quotations to secure North Jersey prices.
BOSTON
Dealers' buying prices per gross ton: No. 1 hvy. mltng. steel. \$10.75 to \$11.00 Scrap rails
EXPORT
Brokers' buying prices per gross ton: New York, delivered alongside barges No. 1 hvy. mltng. steel \$11.00 No. 2 hvy. mltng. steel 10.00 No. 2 cast 10.00 Stove plate 9.00 Rails (scrap) \$10.75 to 11.00 Boston on cars at Army Base or Mystic Wharf No. 1 heavy melting steel \$12.00 No. 2 heavy melting steel \$12.00 No. 3 heavy melting steel \$12.00 No. 4 heavy melting steel \$12.00 Nails (scrap) 2.50 Stove plate 7.75 Machine shop turn 6.00 New Orleans, on cars at Stuyeesant Dock No. 1 hvy. mltng. steel .\$12.60 to \$12.75 No. 2 hvy. mltng. steel .\$12.60 to \$12.75 Los Angeles, on cars or trucks at local piers No. 1 hvy. mltng. steel .\$10.50 to \$11.00 Compressed bundles 8.50 to 9.00
Compressed bundles 8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

PRICES ON FINIS	SHED AND SEMI-FINISHED II	RON AND STEEL
SEMI-FINISHED STEEL Billets, Blooms and Slabs	Plates Base per Lb. 1 946	Light Cold-Rolled No. 20 gage, f.o.b. Pittsburgh. 3.05c. No. 20 gage, f.o.b. Gary 3.15c. No. 20 gage, del'd Detroit 3.25c. No. 20 gage, del'd Philadelphia. 3.36c. No. 20 gage, f.o.b. Birmingham 3.20c.
	F.o.b. Pittsburgh 1.90c. F.o.b. Chicago or Gary 1.95c.	No. 20 gage, f.o.b. Gary 3.15c. No. 20 gage, del'd Detroit 3.25c
F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Bir- mingham. Prices at Duluth are \$2 a	Del'd Cleveland	No. 20 gage, del'd Philadelphia3.36c.
ton higher, and delivered Detroit \$3	Del'd Philadelphia 2.09c. Del'd New York 2.19c.	No. 20 gage, 1.0.b. Birmingnam .3.20c. No. 20 f.o.b. cars dock Pacific
higher.	Foh Birmingham 205c	ports3.60c.
Rerolling	F.o.b. cars dock Gulf ports 2.30c.	Galvanized Sheets
Forging quanty 39.00	F.o.b. cars dock Pacific ports 2.45c. Wrought iron plates, f.o.b.	No. 24 gage, f.o.b. Pittsburgh. 3.20c. No. 24, f.o.b. Gary
Sheet Bars	Wrought iron plates, f.o.b. Pittsburgh 3.20c.	No. 24, 1.0.b. Gary
F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton,	Floor Plates	No. 24, f.o.b. Birmingham3.35c.
Sparrows Point, Md.	F.o.b. Pittsburgh 3.45c.	ports
Open-hearth or Bessemer \$32.00	F.o.b. Coatesville 3.50c.	No. 24, wrought iron, Pitts- burgh4.95c.
Skelp	F.o.b. Chicago 3.50c. F.o.b. Coatesville 3.55c. F.o.b. cars dock Gulf ports 3.55c. F.o.b. cars dock Pacific ports 4.00c.	
F.o.b. Pittsburgh, Chicago, Youngs-		Electrical Sheets (F.o.b. Pittsburgh)
town, Buffalo, Coatesville, Pa., Spar- rows Point, Md.	Structural Shapes Base per Lb.	Base per Lb.
Per Lb.	F.o.b. Pittsburgh 1.90c.	Field grade 3.00c. Armature 3.35c.
Grooved, universal and sheared 1.80c.	F.o.b. Pittsburgh 1,90c. F.o.b. Chicago 1.95c. Del'd Cleveland 2.095c.	Electrical
Wire Rods	F.o.b. Buffalo or Bethlehem 2.00c. Del'd Philadelphia 2.115c. Del'd New York 2.1625c. F.o.b. Birmingham (standard) 2.05c.	Special Motor 4.90c, Special Dynamo 5.60c.
(No. 5 to 15/32 in.)	Del'd New York2.113c.	Transformer 6.10c. Transformer Special 7.10c.
F.o.b. Pittsburgh or Cleveland.\$40.00	F.o.b. Birmingham (standard) 2.05c. F.o.b. cars dock Gulf ports 2.30c.	Transformer Extra Special 7.60c.
F.o.b. Chicago, Youngstown or	F.o.b. cars dock Pacific ports 2.45c.	Silicon Strip in coils—Sheet price
F.o.b. Chicago, Youngstown or Anderson, Ind	Steel Sheet Piling	plus silicon sheet extra width extras, plus 25c. per 100 lb. for coils.
F.o.b. Birmingham	Base per Lb.	Long Ternes
F.o.b. Galveston 46.00	F.o.b. Pittsburgh	
	F.o.b. cars dock Gulf or Pacific Coast ports 2.70c.	No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh
BARS, PLATES, SHAPES	Coast ports 2.10c.	F.o.b. Gary3.60c. F.o.b. cars dock Pacific ports4.29c.
Iron and Steel Bars		Vitreous Enameling Stock
Soft Steel	RAILS AND TRACK SUPPLIES	No. 20, f.o.b. Pittsburgh 3.05c. No. 20, f.o.b. Gary 3.15c. No. 20, f.o.b. Birmingham 3.65c.
F.o.b. Pittsburgh 2.05c.	F.o.b. Mill	No. 20, f.o.b. Gary
F.o.b. Chicago or Gary 2.10c. F.o.b. Duluth 2.20c. Del'd Detroit 2.20c.	Standard rails, heavier than	No. 20, f.o.b. cars dock Pacific ports3.65c.
Del'd Detroit 2.20c.	60 lb per gross ton\$36.37½ Angle bars, per 100 lb 2.55	Tin Mill Black Plate
	F.o.b. Code Basing Points	No. 28, f.o.b. Pittsburgh2.75c
Del'd Philadelphia 2.36c.		No. 28, Gary
F.o.b. Buffalo 2.15c. Del'd Philadelphia 2.36c. Del'd New York 2.40c. F.o.b. Birmingham 2.20c.	Light rails (from billets) per gross ton\$35.00	Tro. 20, care dock facilio porte.
F.o.b. cars dock Gulf ports 2.45c. F.o.b. cars Pacific ports 2.60c.	Light rails (from rail steel) per gross ton 34.00	Tin Plate
rioidi cara i acino porcaii a.vvc.	Base per 100 Lb.	Standard cokes, f.o.b. Pitts-
Rail Steel		burgh district mill\$5.25 Standard cokes, f.o.b. Gary 5.35
(For merchant trade)	Spikes	Standard cokes, 1.0.b. Gary 5.35
F.o.b. Pittsburgh 1.90c. F.o.b. Cleveland, Chicago, Gary	Track bolts, to steam railroads. 3.75c.	Terne Plate
or Moline, Ill 1.95c.	Track bolts, to jobbers, all sizes (per 100 counts) 70 per cent off list	(F.o.b. Pittsburgh)
F.o.b. Birmingham 2.05c.		(Per Package, 20 x 28 in.) 8-lb. coating I.C\$10.00 15-lb. coating I.C
F.o.b. Cleveland, Chicago, Gary or Moline, Ill. 1.95c. F.o.b. Buffalo 2.00c. F.o.b. Birmingham 2.05c. F.o.b. cars dock Gulf ports. 2.30c. F.o.b. cars dock Pacific ports. 2.45c.	Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Porismeuth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa. Bichmond, Vongstown, Lebanon, Pa.	15-lb. coating I.C
	Weirton, W. Va., St. Louis, Kansas City,	25-lb. coating I.C 14.00
Billet Steel Reinforcing	ports; on tie plates alone, Steelton, Pa.,	30-lb. coating I.C
(Straight lengths as quoted by distributors)	Pa., Richmond, Va.	
F.o.b. Pittsburgh 2.05c.		Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 In.
F.o.b. Pittsburgh 2.05c. F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary	SHEETS, STRIP, TIN PLATE,	Base per Lb.
or Birmingham 2.10c. Del'd Detroit 2.20c.	TERNE PLATE	All widths up to 24 in., P'gh. 1.95c. All widths up to 24 in., Chicago. 2.05c.
F.o.b. cars dock Gulf ports 2.45c.	Sheets Hot Rolled	All widths up to 24 in., del'd Detroit2.15c.
F.o.b. cars dock Pacific ports 2.45c.	Base per Lb.	All widths up to 24 in., Birmingham2.10c.
Rail Steel Reinforcing	No. 10, f.o.b. Pittsburgh1.95c.	mingham
(Straight lengths as quoted by distributors)	No. 10, f.o.b. Gary	Cooperage stock, Chicago2.15c.
	No. 10, del'd Detroit	Cold-Rolled Strips*
F.o.b. Pittsburgh	No. 10, f.o.b. cars dock Pacific	Base per Lb.
or Birmingham 1.95c. F.o.b. cars dock Gulf ports 2.30c.	ports2.50c.	F.o.b. Pittsburgh
F.o.b. cars dock Gulf ports 2.30c. F.o.b. cars dock Pacific ports. 2.30c.	Hot-Rolled Annealed	Del'd Chicago
	No. 24, f.o.b. Pittsburgh 2.60c. No. 24, f.o.b. Gary 2.70c.	F.o.b. Worcester2.80c.
F.o.b. Chicago1.80c.	No. 24, del'd Detroit	* Carbon 0.25 and less.
F.o.b. Pittsburgh (refined) 2.10c.	No. 24, f.o.b. Birmingham 2.75c.	Cold-Rolled Spring Steel
F.o.b. Pittsburgh (refined) 2.10c. Delivered New York 2.05c. Delivered Philadelphia 2.10c.	No. 24, f.o.b. cars dock Pacific ports 3.25c.	Pittsburgh and
	No. 24, wrought iron, Pitts- burgh	Carbon 0.25-0.50% 2.60c. 2.80c.
Cold Finished Bars and Shafting* Base per Lb.		Carbon .5175 3.70c. 3.90c.
	Heavy Cold-Rolled	Carbon .76-1.00 5.45c. 5.65c. Carbon Over 1.00 7.50c. 7.70c.
F.o.b. Pittsburgh 2.35c. F.o.b. Cleveland, Chicago and	No. 10 gage, f.o.b. Gary2.70c.	Fender Stock
Gary 2.40c. F.o.b. Buffalo 2.45c. Del'd Detroit 2.50c.	No. 10 gage, f.o.b. Pittsburgh 2.60c. No. 10 gage, f.o.b. Gary 2.70c. No. 10 gage, f.o.b. Detroit 2.80c. No. 10 gage, del'd Philadelphia 2.91c. No. 10 gage, f.o.b. Birmingham . 2.75c.	No. 14 Pittsburgh or Cleveland, 2,90c.
Del'd Detroit	No. 10 gage, f.o.b. Birmingham2.75c.	No. 14, Worcester
*In quantities of 10,000 to 19,999 lb.	No. 10 gage, f.o.b. cars dock Pacific ports	No. 20, Worcester3.70c.

WIRE PRODUCTS

(Carloa i, lots, f.o.b. Pittsburgh and Cleveland.)

	cturing Trade Per	ring	uı	et	10	fe	u	Man	To
Bright wire	2.1							ire	Bright w

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To the Trade

Duse per moy
Standard wire nails\$2.05
Smooth coated nails 2.05
Base per 100 Lb.
Annealed fence wire \$2.80
Galvanized fence wire 3.15
Polished staples 2.75
Galvanized staples 3.00
Barbed wire, galvanized 2.55
Twisted barbless wire 2.55
Woven wire fence, base column 60
Single loop bale ties, base col-

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

umn

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi. Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are 86 a ton over Pittaburgh.
On nails, staples and barbed wire, prices of 86 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought

Butt Weld

In. Black Galv.	In. Black Galv.
1457 37 14 to % 60 44½ 1564½ 59 1 to 369½ 61½	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

	Lup	Meser	
62	531/2	237	221/2
3.65	561/2	2½to3½ 38 4 to 840	25
6.67	5814	4 to 840	281/2

21/2 31/2 7 9	to to &	3.65 6.67 8.66 10.65 ½ 12.64 ½	56 1/2 58 1/2 56 1/2 56	2 2 1/2 to 4 to 9 to	3½ 38 840 1238	22 ½ 25 28 ½ 24 ½

	Weld, e				
1 to	%.55½ %.57½ 62½ 66½ 368	42 1/4 46 1/4 54 1/4 58 1/2 61	1/4 & % 1/4 & % 1/4 to 2	+13 +2½ 32½ 37½ 43½	+451/4 +341/4 171/4 221/4 29

Lap Weld, extra	strong, plain ends
260 521/2 21/2 to 3.64 561/2	240 26
3½ to 6.67½ 60	2½ to 4.45½ 33 4½ to 6.45 33½
7 & 866 1/2 57	7 & 8 .46 33
9 & 1065 ½ 56 11 & 1264 ½ 55	9 to 12.41½ 30

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2% points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
l in. o.d	13 B.W.G. 13 B.W.G.	\$ 8.60	\$ 7.82
1% in. o.d 1% in. o.d	13 B.W.G.	11.26	10.23
2 in. o.d	13 B.W.G.	14.35	13.04
214 in. o.d	12 B.W.G.	17.61	16.01
2½ in. o.d		19.29	17.54

3 in. o.d	12 B.W.G.	\$21.45	\$19.50
41/4 in. o.d	10 B.W.G.	41.08	37.35
31/2 in. o.d	11 B.W.G.	27.09	24.62
4 in. o.d	10 B.W.G.	33.60	30.54
41/4 in. o.d	10 B.W.G.	41.08	37.35
5 in. o.d	9 B.W.G.	51.56	46.87
6 in. o.d	7 B.W.G.	79.15	71.90
Extra for le	ss-carload qu	antities:	
25,000 lb. or ft.	to 39,999 11	or ft.	5 %
	to 24,999 lb		1214%
6,000 lb. or ft.	to 11,999 It	or ft.	25 %
2,000 lb. or ft.	te 5,999 lt	or ft.	35 %
Under 2,000 lb. or	ft		

CAST IRON WATER PIPE

Per Net Ton
*6-in. and larger, del'd Chicago.\$48.40 6-in. and larger, del'd New York 45.20
*6-in. and larger, Birmingham 40.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles 48.00
F.o.b. dock, Seattle 40.50 F.o.b. dock, Seattle 51.50
Class "A" and gas pipe, \$3 extra. 4-in. pipe is \$3 a ton above 6-in.

*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$39. Birmingham, and \$47.40, delivered Chicago and 4-in. pipe, \$42. Birmingham, and \$50.40 a ton. delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:
1/2 in. x 6 in. and smaller 70 and 10
Larger than 1/2 in70 and 5
Lag bolts
Plow bolts, Nos. 1, 2, 3, and 7
heads70 and 5
Trat masses a series the series to and the
Hot-pressed nuts, blank or tapped,
square
Hot-pressed nuts, blank or tapped.
hexagon
Che and the servers are beautiful to
C.p.c. and t. square or hex. nuts,
blank or tapped70 and 5
Semi - finished hexagon nuts.
U.S.S. and S.A.E., all sizes
60, 20 and 10
Stove bolts in packages, nuts at-
tached
Stove bolts in packages, with nuts
gongrato in pacitagos, with huts
separate
Stove bolts in bulk821/2
Tire bolts50 and 8
and the second s

On stove bolts freight is allowed to destina-tion on 200 lb. and over.

Large Rivets (14-in. and larger)

Base per 100 Lb. F.o.b. Pittsburgh or Cleveland..\$3.05 F.o.b. Chicago or Birmingham.. 3.15

Small Rivets (7/16-in. and smaller)

				n		-	~			# T.	- 4
				r	0	r	0	en.	i U	ff Li	38
F.o.b.	Pittsburgh								.70	and	5
F.o.b.	Cleveland								.70	and	5
F.o.b.	Chicago and	a	10	111	PP	n	200	2 222	70	and	5

Cap and Set Screws

(Freight allowed used in ceeding 65c. per 100 lb. or more)	p to but not ex- lbs. on lots of 200
	Per Cent Off List
Milled cap screws, smaller	50 and 10

smaller	10
Milled standard set screws, case	
hardened, 1 in. dia, and smaller	75
Milled headless set screws, cut	-
thread % in. and smaller	75
Upset hex, head cap screws U.S.S.	
or S.A.E. thread, 1 in. and	
smaller	60
Upset set screws, cup and oval	
points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, \$51 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton. Open-hearth grade, base...... 2.55c. Delivered price at Detroit is... 2.70c.

S.A.E.	Alloy
Series	Differential
	per 100 lb.
2000 (%% Nickel)	
2100 (2½% Nickel)	
2300 (3½% Nickel)	
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybden	um
(0.15 to 0.25 Molybde	num). 0.50
4100 Chromium Molybden	um
(0.25 to 0.40 Molybde	num). 0.79
4600 Nickel Molybdenum	(0.20
to 0.30) Molybdenum	(1.50
to 2.00 Nickel) 5100 Chromium Steel (0	1.05
5100 Chromium Steel (0	.60 to
0.90 Chromium) 5100 Chromium Steel (0.	0.35
5100 Chromium Steel (0	.80 to
1.10 Chromium)	0.45
5100 Chromium Spring St	el,base
6100 Chromium Vanadium	
6100 Chromium Vanadium	0.70
Spring Steel Chromium Nickel Vanadiu	1.40
Carbon Vanadium	0.95
These prices are for hot-rolled	iteel bars. The
differential for most grades in steel is 50c. higher. The differ	ential for cold-
drawn pars %c. per lb. higher	with separate
extras. Blooms, billets and sl	abs under 4x4
in. or equivalent are sold on Slabs with a section area of 16	the bar base.
thick or over take the billet	base. Sections
4x4 in, to 10x10 in, or equivalen	t carry a gross
ton price, which is the net price	for bars for the
same analysis. Larger sizes carry	extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.05c. base per lb. Delivered Detroit, 3.20c.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% Ni, 0.08 to 0.20% C.) (Base Prices f.o.b. Pittsburgh)

,													P	er Lb.
Forging billets														
Bars			41				×	*	*	*		*		23c.
Plates														
Structural shap	e	8					0				0		0	23c.
Sheets													*	33c.
Hot-rolled strip														
Cold-rolled strip														
Drawn wire				•			0			0		0	9	23c.

TOOL STEEL

		IOOL	SIFFF		
					per Lb.
High sy	peed				. 571/2 C.
High c	arbor	chro	me		. 37c.
Oil har					
Special					. 19c.
Extra					. 15%c.
Regular					. 121/2 c.
Driege	for we	rehouse	distribut	ion to	all points

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental BRITISH

Per Gross Ton f.o.b. United Kingdom Ports Based on Exchange rate as of Oct. 6

Ferromanganese, ex-	\$45.58		
Billets, open-hearth	29.74	to	\$31.01
Tin plate, per base			
box	4.74	to	4.84
Steel bars, open-hearth	39.87		
Beams, open-hearth	38.61		
Channels, open-hearth	39.87		
Angles, open-hearth	38.61		
Black sheets, No. 24			
gage	51.66		
Galvanized sheets. No.			
24 gage	61.50		

CONTINENTAL

Per Metric Ton, f.o.b. Continental Ports Based on Exchange rate of Oct. 6

Billets, Thomas\$19	.27
Wire rods No. 5 B.W.G 30	.30
Steel bars, merchant 26	.64
Sheet bars	.68
Plate. 4 in. and up 35	.42
Plate, 3/16 in. and 5 mm 34	.85
Sheets. 1/4 in 36	.90
	.58
Angles (Basic) 25	.58
Hoops and strip base 32	.79
Wire, plain, No. 8 44	.03
Wire nails	.15
Wire, barbed, 4 pt. No. 10	
B.W.G 71	74
B. W.G	

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH
Plates
Hot-rolled annealed sheets (No. 24), 25 or more bundles 3.45c. Galv. sheets (No. 24), 25 or
more bundles
Per Cent Off List Track bolts, all sizes, per 100 count
On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb. *Delivered in Pittsburgh switching district.
CHICAGO
Plates and structural shapes. 3.30c. Soft steel bars, rounds 3.20c.
Soft steel bars, squares and hexagons
Rounds and hexagons
Machine bolts
Carriage bolts
blank
Spring cotters
Com. wire nails, 50 kegs or more 2.50c.† Cement c't'd nails, 50 kegs or more 2.50c.†
On plates, shapes, bars. hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.ob. consumers' plants within the Chicago switching
district. *These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 60c per 100 lb.
60c. per 100 lb. †Prices for city and suburbs only.
Base per Lb. Plates, ¼ in. and heavier 3.50c. Structural shapes 3.47c. Soft steel bars, rounds 3.51c.
coal
Flats and squares 4.06c. Cold-rolled; strip, soft and quarter hard 3.36c.

_	ND STEEL WAKEHOUSE I	
	Hoops	
	3.15c. to 3.41c. Hot-rolled ann'l'd sheets (No. 24*)	
	Long terne sheets (No. 24)	
	Armco iron, galv. (No. 24†) 5.65c. Toncan iron, galv. (No. 24†) 5.65c. Galvannealed (No. 24†) 5.75c. Armco iron, hot-rolled annealed (No. 24†) 5.10c. Toncan iron, hot-rolled annealed (No. 24†) 5.10c. Armco iron hot-rolled (No. 10†) 4.15c. Armco iron hot-rolled (No. 10†) 4.15c.	
	Toncan iron, hot-rolled (No. 10†) 4.15c. Cold-rolled sheets (No. 20) less than 1000 lbs.	
	Stretcher leveled	
	Floor plate ½ in. and heavier 5.30c. Standard tool steel	
	steel	
	Machine bolts, square head and nut:	
	All diameters65 and 10 Carriage bolts, cut thread: All diameters65 and 10	
	 No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb. † 125 lb. and more. 	
	ST. LOUIS Base per Lb.	
	Bars, soft steel (rounds and flats)	
	cold-in. rounds, shafting, screw stock	
	Hot-rolled sheets (No. 10) 3.40c. Black corrug. sheets (No. 24) 4.30c. Galv. corrug. sheets 4.90c. Structural rivets 4.15c. Boiler rivets 4.25c. Per Cent Off List	
	Tank rivets, 7/16 in. and smaller. 55 Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	
	*No. 26 and lighter take special prices.	
	PHILADELPHIA	
	#Plates, ¼-in. and heavier	
	24)	
	These prices are subject to quantity differential except on reinforcing and Swedish iron bars. *Base prices subject to deduction on orders aggregating 4000 lb. or	
	over. †For 25 bundles or over. ‡For less than 2000 lb.	

CLEVELAND Base per Lb.
Plates and struc. shapes 3.41c. Soft steel bars 3.10c. †Reinforc. steel bars 2.10c. †Cold-finished steel bars 3.75c. Flat-rolled steel under ¼ in. 3.46c. Cold-finished strip 13.00c. Hot-rolled annealed sheets (No. 24) 3.91c. Galvanized sheets (No. 24) 4.61c. Hot-rolled sheets (No. 10) 3.21c. Hot-rolled 3/16 in. 24 to 48 in. wide sheets 3.46c. *Black ann'l'd wire, per 100 lb. \$2.80
*Com. wire nails, base per keg. 2.25
†Outside delivery 10c. less. *For 5000 lb. or less. ‡Plus switching and cartage charges and quantity differentials up
CINCINNATI
Plates and struc. shapes
Cold-finished bars 3.97c. Hot-rolled annealed sheets (No. 24) 25 bundles or more. 3.72c. Galv. sheets (No. 24) 3750 lb. or more 4.07c.
more 4.07c. Galvanized sheets (No. 24) over 3500 lb. 4.07c. Hot-rolled sheets (No. 10) 3.32c. Structural rivets
(1000 lb. or over) \$2.88 Com. wire nails, base per keg: Any quantity less than carload. Cement c't'd nails, base 100-lb keg 3.50 Chain. lin. per 100 lb 8.35
Net per 100 Ft.
BUFFALO Base per Lb.
Plates 3.48c.
Bands 3.53c. Hoops 3.53c. Heavy top-rolled sheets 3.28c. Com. wire nails, base per keg. \$2.85 Black wire, base per 100 lb. (2500-lb. lots or under) 4.00 (Over 2500 lb.) 3.90
ROSTON
Channels, angles 3.65c. Tees and zees, under 3" 3.90c. H beams and shapes 3.84c. Plates — Sheared, tank, and univ. mill, ¼ in. thick and heavier 3.66c. Floor plates diamond pattern 5.46c. Bar and war shapes (mild steel) 3.65c.
heavier 3.66c. Floor plates. diamond pattern 5.46c. Bar and ar shapes (mild steel) 3.65c. Bands 3/16 in. thick and No. 12 ga. incl. 3.75c. to 4.75c.
No. 12 ga. incl 3.75c. to 4.75c. Half rounds, half ovals, ovals and bevels 4.90c. Tire steel 2.45c. Cold-finished rounds, squares and hexagons 4.16c. Cold-finished flats 4.10c. Blue annealed sheets, No. 10 ga. 3.75c. One pass cold-rolled sheets No. 24 ga. 4.30c. Galvanized steel sheets, No. 4.30c.
Galvanized steel sheets, No. 24 ga 4.30c. Lead coated sheets, No. 24 ga. 5.95c. Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per	Lb.
Soft steel bars 3	.29c.
Structural shapes 3	.52c.
Plates 3	.52c.
Floor plates 5	.27c.
Hot-rolled annealed sheets	
(No. 24)*	.14c.
(No. 24)*	.24c.
Galvanized sheets (No. 24) 4	.82c.
Rands 3	.49c.
Danus	.49c.
	.84c.
Cold-rolled strip 3	.18C.
Hot-rolled alloy steel (S.A.E.	
3100 Series) 5	.44c.
Bolts and nuts, in cases,	
70 and 10 per cent off	list
Broken cases65 and 10 per cen	

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

* Base less 0.25c., 3500 lb. and over. Add 0.50c. per hundred lb. for broken bundles.

** Base less 0.25c., 1500 to 3749 lbs.; less 0.50c., 3750 to 7499 lb.; less 0.75c., 7500 lb. and over.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

Country territory to be equalized on the Chicago plan.

MILWAUKEE

Base p	er Lb.
Plates and structural shapes	3.41c.
Soft steel bars, rounds up to 8	
in., flats and fillet angles	
Soft steel bars, squares and	
hexagons	
Hot-rolled strip	
Hot-rolled sheets (No. 10)	3.26c.
Hot - rolled annealed sheets	
(No. 24)	
Galvanized sheets (No. 20)	4.76c.
Cold-finished steel bars	
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	4.01c.
Boiler rivets, cone head (keg	
lots)	4.11c.
Track spikes (keg lots)	4.06c.
Track bolts (keg lots)	5.06c.
Black annealed wire	3.40c.
Com. wire nails	2.60c.
Cement coated nails	2.60c.

Prices given above are delivered Milwaukee.
On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base p	er Lb.
Mild steel bars, rounds	3.45c.
Structural shapes	
Plates	
Cold-finished bars	
Bands and hoops	3.65c.
Hot-rolled annealed sheets,	
No. 24	4.30c.
Galvanized sheets, No. 24	4.90c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

Base p	er Lb.
Mild steel bars and small shapes	3.20c.
Reinforcing barsprices on applie	cation
Plates	3.10c.
Hot-rolled sheets, No. 10	3.20c.
Bands	3.30c.
Hoops	3.55c.
Special threading steel	3.20c.
Diamond pattern floor plates 1/4 in. and heavier	5.10c.
Galvanized bars and small shapes	5.70c.
Galvanized bands	5.80c.
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	3.88c.
All prices are for 2000 lb. and	more.
For second zone add 10c. po	

lb. for trucking.

List size extras of Aug. 15, 1935, and cutting extras to be added.

For cold-rolled products, list size extras from Jan. 1, 1936, and cutting extras to be added.

CHATTANOOGÀ

	Base per Lb.
Mild steel bars	3.46c.
Iron bars	
Reinforcing bars	3.46c.
Structural shapes	
Plates	
Hot-rolled sheets No. 10	
Hot-rolled annealed sheet	
No. 24*	2 960
Steel bands	
Cold-finished bars	

* Plus mill item extra.

MEMPHIS

Base	per Lb.
Mild steel bars	. 3.57c.
Shapes, bar size	. 3.57c.
Iron bars	. 3.57c.
Structural shapes	. 3.77c.
Plates	
Hot-rolled sheets, No. 10	. 3.57c.
Hot-rolled annealed sheets,	
No. 24	. 4.37c.
Galvanized sheets, No. 24	. 5.07c.
Steel bands	
Cold-drawn rounds	. 4.U4C.
Cold-drawn flats, squares,	0.01-
hexagons	
Structural rivets	
Bolts and nuts, per cent off lis	
Small rivets, per cent off lis	JT 50

NEW ORLEANS

Base pe	er Lb.
Mild steel bars	3.45c. 3.50c. 3.65c.
Hot-rolled sheets, No. 10 Hot-rolled annealed sheets, No. 24	
Galvanized sheets, No. 24 Steel bands Cold-finished steel bars	4.55c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	\$2.45 70

PACIFIC COAST

	B	ase per Li	b.
	Ban Fran- cisco	Los Angeles	Seattle
Plates, tank and			
U. M			
Shapes, standard	3.60c.	3.80c.	3.65c.
Soft steel bars	3.60c.	3.80c.	3.90c.
Reinforcing bars, f.o.b. cars dock Pacific ports		2.45c.	2,45c.
Hot - rolled an- nealed sheets (No. 24)		4.35c.	4.60c.
Hot-rolled sheets (No. 10)	3.70c.	3.90c.	3.85c.
Galv. sheets (No. 24 and lighter)	5.00c.	4.60c.	5.00c.
Galv. sheets (No. 22 and heavier)	5.00c.	4.80c.	5.00c.
Cold finished steel			
Rounds	6.05c.	6.10c.	6.00c.
Squares and			
hexagons .	7.30c.	7.35c.	6.35c.
Flats			
Common wire nails—base per keg less carload			

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Wo	rka
High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	5.00
High-heat duty, New Jersey 50	.00
High-heat duty, Ohio 40	.00
Intermediate, Pennsylvania, Maryland, Kentucky, Mis- souri and Illinois	
Intermediate, New Jersey 43	
Intermediate, Ohio 3	
Ground fire clay, per ton	

Silica Brick

	Per	1000	1.0.b.	Works
Pennsylvania				.\$45.00
Chicago Distr	ict			. 54.00
Birmingham			\$48	to 50.00
Silica cement	per ne	t ton		. 8.00

Chrome Brick

Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester\$45.00
Chemically bonded f.o.b. Balti- more, Plymouth Meeting and Chester. Pa. 45.00

Magnesite Brick

		Per Net Ton
Standard f.c Chester, P	a	
Chemically I	bonded, f.o.b	

Grain Magnesite

	Per Ne	t Ton
	f.o.b. Baltimore and Pa. (in sacks)	
Chester.	f.o.b. Baltimore and in sacks	40.00 22.00

PIG IRON	
No. 2 Foundry	
F.o.b. Everett, Mass F.o.b. Bethlehem, Birdsboro, and Swedeland, Pa., and Sparrows Point, Md	
Sparrows Point, Md Delivered Brooklyn Delivered Newark or Jersey	$21.50 \\ 23.9289$
City Delivered Philadelphia F.o.b. Neville Island, Sharps- ville and Erie, Pa.; Buffalo; Youngstown, Cleveland, To-	22,3132
ledo and Hamilton, Ohio; Detroit; Chicago and Gran- ite City, Ill. F.o.b. Jackson, Ohio Delivered Cincinnati F.o.b. Duluth F.o.b. Provo, Utah Delivered San Francisco, Los Angeles or Seattle	20.50 22.25 20.82 21.00 18.50
F.o.b. Birmingham* * Delivered prices on southern iron ment to northern points are 38c. a delivered prices from nearest norther soilst on iron with phosphorus content of the prices of the soilst on	16.88 for ship- ton below n basing
Malleable	
Base prices on malleable in	on are

50c. a tation vania	ton above	re No. 2 rett, Eas s, Erie	foundry quo- tern Pennsyl- and Buffalo same.	
F.o.b.	Everett,	Basic Mass	\$21.00	

F.o.b. Everett, Mass.	\$21.00
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton.	
Pa., and Sparrows Point.	
Md.	
F.o.b. Buffalo	
F.o.b. Neville Island, Sharps-	
ville and Erie, Pa.; Youngs-	
town, Cleveland, Toledo and	
Hamilton, Ohio; Detroit;	
Chicago and Granite City,	20.00
Delivered Cincinnati	19.82
Delivered Canton, Ohio	
Delivered Mansfield, Ohio	21.8832
F.o.b. Jackson, Ohio	21.75
F.o.b. Provo, Utah	18.00
F.o.b. Birmingham	15.50
Bessemer	

F.o.b. Birmingham	15.50
Bessemer	
F.o.b. Everett, Mass F.o.b. Bethlehem, Birdsboro	\$22.50
and Swedeland, Pa Delivered Boston Switching	22.50
District Delivered Newark or Jersey	24.00
City Delivered Philadelphia	23.9873 23.3132
F.o.b. Buffalo and Erie, Pa., and Duluth	
F.o.b. Neville Island and Sharpsville, Pa.; Youngs-	
town, Cleveland, Toledo and Hamilton, Ohio; Detroit;	
Chicago F.o.b. Birmingham	21.00
Delivered Cincinnati Delivered Canton, Ohio	22.0807
Delivered Mansfield, Ohio	22.8832

Low Phosphorus
Basing points: Birdsboro, Pa.,
Steelton, Pa., and Standish,
N. Y\$25.00

Gray Forge Valley or Pittsburgh furnace.\$20.00

Charcoal
Lake Superior furnace\$22.50 Delivered Chicago 25.7528
Canadian Pig Iron Per Gross Ton
Delivered Toronto
No. 1 fdy., sil. 2.25 to 2.75\$21.00 No. 2 fdy., sil. 1.75 to 2.75 20.50 Maileable

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Basic	9	0	0	•	0		0	0		۰			•	•		0		22.00

RAW MATERIALS PRICES

EEDDOALLOVS

FERROALLOYS
F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.
Per Gross Ton Domestic, 80% (carload)\$75.00 Spiegeleisen
Per Gross Ton Furnace Domestic, 19 to 21%\$26.00 50-ton lots 3-mo. shipment 24.00 F.o.b. New Orleans
Per Gross Ton Delivered 50% (carloads) \$69.50 50% (ton lots) 77.00 75% (carloads) 126.00 75% (ton lots) 136.00 Silvery Iron Per Gross Ton
F.o.b. Jackson, Ohio, 6.00 to
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson. Manyanees 2 to 3%, \$1 a ton additional. For
each unit of manganese over 3%, \$1 a ton addi- tional. Phosphorus 0.75% or over, \$1 a ton ad-
Bessemer Ferrosilicon F.o.b. Jackson, Ohio, Furnace
10.00 to 10.50% \$27.75 10.51 to 11.00% 28.25 11.00 to 11.50% 28.25 11.51 to 12.00% 29.25 12.01 to 12.50% 29.75 12.51 to 13.00% 30.25 13.01 to 13.50% 31.25 14.01 to 14.50% 31.25 14.01 to 14.50% 32.25 15.51 to 14.00% 32.25 15.51 to 15.00% 32.25 16.01 to 15.50% 33.75 16.51 to 16.00% 33.25 16.01 to 16.50% 33.75 16.51 to 16.50% 33.75 16.51 to 16.00% 33.25 16.01 to 16.50% 33.75
Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.
than at Jackson. Other Ferroalloys
Ferrotungsten, per lb. contained W del., carloads \$1.30 Ferrotungsten, lots of 5000 lb. 1.35 Ferrotungsten, smaller lots 1.40 Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract 10.00c.
Ferrochromium, 2% carbon
carbon
carbon19.50c. to 20.00c. Ferrochromium, 0.06%
carbon20.00c. to 20.50c.
Ferrocolumbium, per lb. con-
carbon20.00c. to 20.50c. Ferrovanadium, del. per lb. contained V\$2.70 to \$2.90 Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y\$2.50 Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net
ton
per net ton
Rockdale, Tenn., per gross ton 58.50 Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston,
in carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized
with Nashville, Tenn 75.00 Ferromolybdenum, per lb. Mo
with Nashville, Tenn 75.00 Ferromolybdenum, per lb. Mo del 95c. Calcium molybdate, per lb. Mo
with Nashville, Tenn
with Nashville, Tenn 75.00 Ferromolybdenum, per lb. Mo del 95c. Calcium molybdate, per lb. Mo

Note: Spot prices are \$5 a ton higher except on 75 per cent ferrosilicon on which premium is \$10 a ton.

J. 1. 3 & J
ORES
Lake Superior Ores Delivered Lower Lake Ports Per Gross Ton
Delivered Lower Lake Ports Per Gross Ton Old range, Bessemer, 51.50%\$4.80 Old range, non-Bessemer, 51.50% 4.65 Mesabl, Bessemer, 51.50%4.50 Mesabl, non-Bessemer, 51.50%4.60 High phosphorus, 51.50%4.40 Foreign Ore
C.i.f. Philadelphia or Baltimore
Iron, low phos., copper free, 55 to 58% dry Algeria
Iron, basic or foundry, Swedish, aver. 65% iron10.00c.
Iron, low phos., Swedish, average, 68½% ironNominal Iron, basic or foundry, Swedish, aver. 65% iron10.00c. Iron, basic or foundry, Russian, aver. 65% ironNominal Man., Caucasian, washed 52%. 27c. Man., African, Indian, 44-48%. 25c. Man., African, Indian, 49-51% 27.00c. Man., Brazilian, 46 to 48½%. Nominal 26c.
Tungeten Chinege wolframite
duty paid delivered nominal
Atlantic Seaboard (African).\$17.50
48% Cr ₂ O ₃ (African)
Chrome concentrate, 50% and over Cr ₂ O ₃ , c.l.f. Atlantic ports 22,00 52% Cr ₂ O ₃ (Turkish)
FLUORSPAR Per Net Ton
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail
mines, all rail
Foreign, 85% calcium fluoride, not over 5% silicon, c.l.f. Atlantic ports, duty paid 22.00 Domestic No. 1 ground bulk, 95
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not
over 21/2% silicon, f.o.b. Ill-
rois and Kentucky mines 35.00
to 98% calcium fluoride, not over 2½% silicon, f.o.b. Ill-nois and Kentucky mines 35.00 FUEL OIL F.o.b. Bayonne or Baltimore No. 3 distillate
F.o.b. Bayonne or Baltimore No. 3 distillate
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F.o.b. Bayonne or Baltimore No. 3 distillate

MIMGAIRA BRAND FERRO - ALLOYS

For High Quality Steels

FERRO SILICON

FERRO CHROMIUM

FERRO CHROMIUM

FERRO MANGANESE

SILICO MANGANESE

PITTSBURGH METALLURGICAL CO., Inc.

NIAGARA FALLS. N. Y.

Sales Offices: NEW YORK-30 Church St. • PITTSBURGH-Oliver Bldg. • CLEVELAND-Hanna Bldg.



FABRICATED

STEEL

... Lettings in better volume at 18,365 tons as against 9200 tons last week.

0 0 0

... New projects slightly higher at 13,770 tons compared with 12,700 tons a week ago.

0 0 0

. . . Plate awards total 1390 tons.

NORTH ATLANTIC STATES

Biddeford-Saco, Me., 275 tons, bridge, to American Bridge Co.

Brownfield, Me., 235 tons, bridge, to Harris Structural Steel Co., Plainfield, N. J.

Milford, Me., 140 tons, bridge at Otter Stream, to American Bridge Co.

Norwalk, Conn., 105 tons, State highway bridge, to American Bridge Co.

Stamford, Conn., 250 tons, mill building, Edwards & Co., to Bethlehem Steel Co.

New York, 2375 tons, Department of Sanitation garage, 56th Street and 12th Avenue, to Bethlehem Fabricators, Inc.

New York, 140 tons, alteration to building, 253 Broadway, to Norton Steel Co.

New York, 3800 tons, Sixth Avenue subway, route 101, section 11, to Bethlehem Steel Co.

Steel Co.

Brooklyn, 900 tons, brewery building, Schaefer Brewing Co., to Ingalls Iron Works Co., Birmingham.

Brooklyn, 155 tons, service station, Treasury Department Procurement Division, to Egleston Brothers & Co., Long Island City,

Jamaica, N. Y., 500 tons, Mary Louis Academy, to Lehigh Structural Steel Co., Allentown, Pa.

Linwood, N. Y., 145 tons, grade crossing elimination, to American Bridge Co.

Baldwinsville, N. Y., 550 tons, highway bridge, to Phoenix Bridge Co., Phoenixville, Pa.

Buffalo, 130 tons, National Apiline & Chemical Co. building, to Ernst Iron Works, Buffalo.

Avenel, N. J., 140 tons, grade crossing elimination, to Bethlehem Steel Co.

St. Clair, Pa., 350 tons, high school, to Bethlehem Steel Co.

Philadelphia, 125 tons, extension to building at Navy Yard, to Belmont Iron Works, Philadelphia.

Latrobe, Pa., 255 tons, high school, to Moore Metals Mfg. Co.

Williamsburg, Pa., 280 tons, highway bridge, to Fort Pitt Bridge Works Co., Pittsburgh.

SOUTH AND SOUTHWEST

Coal Creek, Tenn., 210 tons, substation extension, TVA, to Lehigh Structural Steel Co., Allentown, Pa.

Miami, Fla., 1200 tons, overseas road and toll bridge, to Bethlehem Steel Co.

Baytown, Tex., 140 tons, pump house, to Ingalls Iron Works Co.

Ruliff, Tex., 285 tons, bridge, to American Bridge Co.

Texas-Oklahoma, 1650 tons, Red River bridge, to Kansas City Bridge Co., Kansas City, Mo.

State of New Mexico, 250 tons, bridge, to American Bridge Co.

CENTRAL STATES

Dearborn, Mich., 360 tons, railroad bridge over route 24, to Bethlehem Steel Co.

Bucyrus, Ohio, 450 tons, Crawford County bridge, to Burger Iron Co., Akron, Ohio.

Cleveland, 600 tons, alterations for Brewing Corp. of America, to Bethlehem Steel Co.

Tippecanoe County, Ind., 865 tons, highway bridge, to Vincennes Steel Corp., Vincennes, Ind.

St. Louis, 555 tons, addition to Ruberoid Co. plant, to Mississippi Valley Structural Steel Co., St. Louis.

Rock Island Railroad, 250 tons, bridge, to American Bridge Co.

WESTERN STATES

Cedar City, Utah, 500 tons, bridge, to Bethlehem Steel Co.

Idaho Springs, Colo., 100 tons, bridge and approaches, to an unnamed bidder.

Denver, 100 tons, improving Boulder-Idaho Springs highway, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS NORTH ATLANTIC STATES

West New York, N. J., 300 tons, post

Newark, N. J., 2500 tons, airplane hangar for Treasury Department.

Belleville, N. J., 400 tons, alterations to building for Wallace & Tiernan, Inc.

Bound Brook, N. J., 380 tons, building for Calco Chemical Co.

Flushing, 350 tons, asphalt plant for city of New York, Harper's Creek and Willetts Point Boulevard; James P. Rice Building Co., Inc., low bidder on general contract.

Queens, N. Y., 360 tons, asphalt plant for city of New York.

Depew, N. Y., 400 tons, transit road grade elimination, D. L. & W. Railroad.

Port Ivory, N. Y., 200 tons, Procter & Gamble warehouse.

Clinton and Delaware Counties, Pa., 230 tons, highway work; bids Dec. 4.

Erie, Pa., 150 tons, hangar.

SOUTH AND SOUTHWEST

Burnet, Tex., 860 tons, bridge.

Phoenix, Ariz., 213 tons, steel arch bridge over Padre Canyon; bids Dec. 4.

CENTRAL STATES

Detroit, 275 tons, section 8, Detroit River intercepter.

Cleveland, 200 tons, building for Pittsburgh Coal Co.

Cleveland, 500 tons, plant extension for Cleveland Twist Drill Co.

Youngstown, 2000 tons, mill extensions for Youngstown Sheet & Tube Co.

Ottawa, Ohio, 500 tons, grade crossing elimination; new bids Dec. 1.

Vermilion, Ohio, 700 tons, grade crossing elimination; bids Dec. 15.

Chicago, 300 tons, manufacturing building, Caspers Tin Plate Co.

Chicago, 700 tons, overhead crossing.

Chicago, 200 tons, extensions to elevated platforms.

Milwaukee, 425 tons, South Chase Avenue subway under C. & N. W. tracks; bids close Dec. 4.

WESTERN STATES

Sugar Creek, Colo., 210 tons, highway bridge.

State of Colorado, 575 tons, bridges.

Golden, Colo., 240 tons, field house for Colorado School of Mines.

South Gate, Cal., 200 tons, felt mill for United States Gypsum Co.

Sacramento, Cal., 400 tons, S Street viaduct; bids Nov. 27.

FABRICATED PLATES

AWARDS

Quabbin, Mass., 420 tons, steel pipe, and pressure and dredge pipe, to Walsh Holyoke Steam Boiler Works, Holyoke, Mass

Chelsea, Mass., 830 tons, oil tanks for Metropolitan Coal Co., to Graver Tank & Mfg. Co., East Chicago, Ind.

Baltimore, 140 tons, five barges, Gulf Oil Co., to Pennsylvania Shipyards, Inc., Beaumont, Tex. Incorrectly reported last week to Pusey & Jones, Wilmington, Del.

NEW PROJECTS

Langley Field, Hampton, Va., 900 tons, for National Advisory Committee for Aeronautics, pressure wind tunnel, 18 x 20 ft. (Req. R-745).

Issaquah, Wash., 365 tons, 8-in. pipe for water system.

SHEET PILING

AWARDS

Buffalo, 100 tons, for Tonawanda Iron Co., to Carnegie-Illinois Steel Corp.

Le Claire, Iowa, 300 tons, dam across Mississippi River, to Inland Steel Co.

98-THE IRON AGE, November 26, 1936

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... Best business since 1929 is reported by some dealers and manufacturers.

... Orders are diversified and usually in quantities not to exceed two or three tools.

New York

THE best business since 1929 is reported by several machine tool sellers here. An increase in business since the election has resulted in the extension in many cases of already greatly delayed delivery schedules. Orders are diversified and widespread. There has been little quantity buying of late, orders for two and three machines being about the maximum. Standard machines seem more in demand than the specialized types. General Electric, American Locomotive and American Car & Foundry have been active buyers lately. Sellers are unanimous in the belief that 1937 will be just as good as this year, if not better.

Cleveland

DEALERS are getting a fair volume of orders for small machines and are quoting on many machines that prospective purchasers wish to include in 1937 budgets. Business continues good with machine tool builders, or ders being for single tools for small lots from widely diversified industries. Sales exceed shipments with a leading local turret lathe manufacturer, whose deliveries now extend to next February and March on small models. The percentage of turret lathe orders for the larger types of machines has increased, which indicates a more active demand from capital goods industries. Foreign demand for machine tools is quite active.

Pittsburgh

NQUIRIES have taken another spurt and are more active than a week ago. Volume of requests for data is now approximating and in some cases equal to the activity which took place in 1929. While the majority of requests are for quotations on individual machines, some represent quite sizable items. Orders continue good, and many of the current inquiries may develop into orders before the end of the year. The price situation is strong and some dealers have received notices from manufacturers that forecast price advances after the first of the year. This district continues to receive heavy steel mill equipment orders.

Chicago

A TOOL grinder manufacturer has raised prices from 5 to 10 per cent. Other machine tool builders are giving close attention to labor and material costs which will be the determining factors in price moves. The Santa Fe is in the market for a 24-in. tool room lathe. Most other Western railroads are studying requirements and thereby indicate their desires to purchase equipment in 1937. Attractive programs are in the early stages of development by steel mills. A new roll-turning shop is in prospect and several old maintenance shops may be overhauled.

Detroit

PURCHASES by the Packard Motor Car Co. to bolster up production on several of its component lines owing to unprecedented sales of its low-priced cars is still the chief factor in the Detroit market. General Motors has taken no direct steps in the purchase of equipment for manufacturing its own universal joints, although it is understood that the contemplated program has been extended to include joints for all of its units, including Chevrolet. The first program contem-

plated manufacturing parts only for Pontiac. Buick and Oldsmobile. Should the small 60-hp. Ford V-8 engine go across in a big way so far as sales are concerned, the Ford Motor Co. undoubtedly will be in the market for additional equipment. Initial tooling on this job contemplated production of 1200 motors a day, roughly a quarter of the budgeted production of 5000 units. Already, however, there has been a revision upward to an aimed-at total output of 7000 units a day, so that it is quite likely that Ford will become an important factor in the machinery market in the net month or two. With these exceptions, orders for production machinery have been very light in the last few weeks, but most district offices report their factories working at capacity as a result of orders from miscellaneous sources.

Cincinnati

BOOKINGS for one to two machines continue to flow in steadily. Demand is well scattered throughout industrial centers in this country, with orders also from Africa and Europe. Inquiry also is brisk. Production is being held at about 75 per cent of capacity, and manufacturers indicate a desire for more skilled employees. The labor problem, however, is not viewed as serious.

Inland Steel Co. to Build 59 Coke Ovens

NLAND STEEL CO. has awarded Koppers Co., Pittsburgh, a contract for the erection of 59 coke ovens and for other construction and replacements at its Indiana Harbor plant. Work will be started immediately and give employment to 300 men for 10 months. New low differential type Becker ovens with self-sealing doors and other modern auxiliaries will be installed. The ovens are equipped so that they can be fired with blast furnace gas.

Inland Steel's benzol and by-product plants will be remodeled with modern equipment for the production of pure benzol, toluol, xylol and all grades of solvent naphtha. Improvements to the company's coal and coke-handling equipment are included in the contract.

PLANT EXPANSION AND **EQUIPMENT BUYING**

♦ NORTH ATLANTIC ▶

New York Central Railroad Co., 466 Lexington Avenue, New York, has let general contract to Minton Construction Co., 1746 East Twelfth Street, Cleveland, for one-story machine shop at car maintenance and repair works, Ashtabula, Ohio. Cost about \$40,000 with equipment. J. W. Pfau is chief engineer.

Superintendent of Lighthouses, St. George, Staten Island, N. Y., asks bids until Nov. 30 for three automatic electric fog horns (Proposal 52626); until Dec. 3, eight lighthouses service type radio mast antennae, no less than 125 ft. high, complete with frequency insulators, etc. (Proposal 52603); until Dec. 10, 160 motor-driven marine electric flasher mechanisms (Proposal 52625).

Pierce-Arrow Sales Co. of New York, Inc., 625 West Fifty-fifth Street, has leased three-story building, 75 x 100 ft., at 146-50 West Sixty-third Street for main local service and repair plant for Pierce-Arrow cars, including parts department, machine shop and other divisions.

Braunstein-Freres, Inc., New York, affiliated with Standard Products Corp., 19 West Eighteenth Street, manufacturer of paper products, has purchased former Corticelli silk mills of Belding-Hemingway Co., New London, Conn., and will remodel for new paper-converting mill.

Bureau of Highways, Borough of Queens, 21-10 Forty-ninth Avenue, Long Island City, N. Y., has asked bids on general contract for municipal asphalt mixing and distributing plant on two-acre site near Willets Point Boulevard and Harper Avenue, Flushing, L. I., comprising five one and two-story buildings, with mechanical mixers, conveyers, loaders and other machinery. A power house will be installed. Entire project will cost over \$400,000 with equipment. Frank S. Parker, 533 West Fifty-seventh Street, New York, is industrial architect; Frederick H. Shepherd is assistant engineer of bureau.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Dec. 1 for turbine and motor-driven air compressors (Schedule 9331) for Brooklyn Navy Yard; 400 steel boiler tubes (Schedule 9360) for Broo

9360) for Brooklyn, Philadelphia and Nor-folk yards.

Central School District, Mexico, N. Y., plans manual training department in new two-story central school, for which bids are being asked on general contract. Cost about \$500,000. Financing is being arranged through Federal aid. H. O. Fullerton, Washington Avenue, Albany, N. Y., is architect.

Bingham Brothers Co., 406 Pearl Street

ranged through Federal aid. H. O. Fullerton, Washington Avenue, Albany, N. Y., is architect.

Bingham Brothers Co., 406 Pearl Street, New York, manufacturer of printers' rollers and kindred equipment, has leased a two-story factory at Lister Avenue and Brown Street, Newark, N. J., for plant.

Colonial Beacon Oil Co., 30 Rockefeller Plaza, New York, plans new one-story bulk oil storage and distributing plant on lake front at Geneva, N. Y., with steel tanks and other equipment. Cost over \$40,000.

Gottfried Krueger Brewing Co., 75 Belmont Avenue, Newark, N. J., asks bids on general contract until Dec. 5 for extensions and improvements in brewery, including two one-story units, 50 x 101 ft., and 35 x 70 ft., at West Kinney and Chalton Streets, primarily for storage and distribution. Cost over \$80,000 with equipment. Harley & Ellington, Inc., Stroh Building, Detroit, is architect and engineer.

Department of Parks and Public Property, Newark Airport Administration, City Hall, Newark, N. J., has taken out a permit for one, two and three-story hangar.

213 x 1108 ft., at Newark Airport, with shop unit for repair and reconditioning, parts department and other divisions. Cost about \$1,300,000 with equipment.

Norman Geiger, Kearny, N. J., manufacturer of electrical equipment and parts. radio equipment, etc., has leased 42,000 sq. ft. in former textile mill of Clark Thread Co., East Newark, for new plant, with facilities for initial working force of about 500 persons.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Dec. 2 for one motor-driven centerless grinder (Circular 246), one extensiometer (Circular 246), gages, including plain, plug, thread ring, etc. (Circular 242).

Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until Nov. 30 for brass turnbuckle barrels, terminals, turnbuckle assemblies, turnbuckle eyes, etc. (Aero Req. 863), 2400 aluminum alloy bonding clips (Aero Req. 870), die sets, die springs, ball and spring dies retainer, guide pins, punches, bolts and screws (Aero Req. 803); until Dec. 1, two bench type motor-driven grinders (S. & A. Req. 6039).

■ BUFFALO DISTRICT

Standard Brewing Co., Inc., 440 Lake Avenue, Rochester, N. Y., has let general contract to Rudolph J. Graf, 31 Stonewood Avenue, for one and two-story addition, 75 x 115 ft., partly for storage and distribution. Cost over \$75,000 with equipment. Corning Glass Works, Fibrous Products Division, Corning, N. Y., has let general contract to H. K. Ferguson Co., Hanna Building, Cleveland, for three one-story additions, totaling about 46,000 sq. ft., for increase in manufacturing division, melting furnace unit, storage and distribution. Cost over \$100,000 with equipment.

Worthington Pump & Machinery Corp., Clinton and Roberts Streets, Buffalo, has filed plans for two one-story additions, for expansion in foundry and for storage and distribution. Cost about \$60,000 and \$40,000 in order noted.

♦ NEW ENGLAND

Commanding Officer, Ordnance Department, Watertown Arsenal, Watertown, Mass., asks bids until Nov. 30 for one nibbling machine (Circular 205).

Royal Typewriter Co., 150 New Park Avenue, Hartford, has let general contract to Denis O'Brien & Sons. 190 Trumbull Street, for one-story top addition to present two-story factory. Cost over \$40,000 with equipment. Greenwood & Noerr, 525 Main Street, are consulting engineers.

Eastern States Farmers' Exchange, 666 Summer Street, Boston, plans new commercial fertilizer manufacturing plant at Cambridge, Mass. Cost over \$350,000 with machinery. A. E. Baxter Engineering Co., 344 Delaware Avenue, Buffalo, is consulting engineer.

344 Delaware Avenue, Buffalo, is consulting engineer.

Goodyear Rubber Co., Middletown, Conn., has leased for expansion former plant of Westinghouse Electric & Mfg. Co., comprising four-story factory, 100 x 208 ft., and two smaller structures.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Dec. 1 for one motor-driven centerless grinder for Newport, R. I., Naval Station (Schedule 9302).

Commanding Officer. Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Nov. 30 for metal slitting saws, cutters, countersinks, drills, drill sets, side milling cutters, etc. (Circular 86).

◆ SOUTH ATLANTIC ▶

International Harvester Co., 606 South Michigan Avenue, Chicago, motor truck division, asks bids on general contract until Nov. 30 for one-story factory branch, service, storage and distributing plant, 110 x 165 ft., at Atlanta, Ga. Cost close to \$100,000 with equipment. O. A. Krueger is company engineer, first noted address. Brunswick Pulp & Paper Co., Brunswick, Ga., recently organized, has let general contract to Stone & Webster Engineering Corp., Boston, for new pulp mill on 40-acre tract near Brunswick, lately acquired, comprising one and multi-story units for pulp production, bleaching, storage and distribution, also experimental paper-making and processing mill for high-grade paper from slash pine pulp. Cost over \$1,500,000 with machinery. Company is affiliated with Mead Corp., Chillicothe, Ohio, and Scott Paper Co., Chester, Pa. Charles R. Van de Carr, vice-president of Mead Corp. is president; J. L. Ober is vice-president and general manager.

District Quartermaster, Fort Barrancas,

dent; J. L. Ober is vice-president and general manager.

District Quartermaster, Fort Barrancas, Fla., asks bids until Dec. 2 for drill press, bench saws, jig or scroll saw, lathes, planer or jointer (Proposal 401-39).

■ WASHINGTON DIST. ▶

Flynn & Emrich Co., 301 North Holliday Street, Baltimore, manufacturer of stokers and parts, and kindred equipment, has asked bids on general contract for one-story addition. Cost about \$40,000 with equipment. W. S. Austin, Maryland Trust Building, is consulting engineer.

General Purchasing Officer, Panama Canal, Washington, asks bids until Dec. 1 for copper nails, sheathing nails, boat nails, safety chain, phosphor bronze spring wire, gate valves, globe valves, toggle switches, transformers and other equipment (Schedule 3198).

Southern State Cooperative Mills, Inc., 2101 East Fort Avenue, Baltimore, has plans for new works for manufacture of commercial fertilizer, to include power house. Cost over \$200,000 with machinery. W. G. Wysor is general manager.

Division of Purchase, Sales and Traffic, Department of Agriculture, Washington, asks bids until Dec. 1 for one portable belt-type pit conveyer and one steel crusher bin for Grand Junction, Colo. (Proposal 7980); until Dec. 4, steel fence posts or line posts (Proposal 7952).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Dec. 1 for one motor-driven power hacksaw and spare parts (Schedule 9308), four motor-driven universal milling machines (Schedule 9341) for Norfolk, Va., Navy Yard; 19 electric arc welding sets (Schedule 9304) for Washington; valves and pipe fittings (Schedule 9281), 150 aircraft engine synchronizers (Schedule 9312), lubricated cocks and plugs (Schedule 9312), lubricated cocks and plugs (Schedule 9323), calipers, dividers, gages, planes and squares (Schedule 9320), boring bits, chisels, knives, etc. (Schedule 9301) for Eastern and Western yards.

■ SOUTH CENTRAL

Falls City Brewing Co., Thirty-first Street and Broadway, Louisville, has let general contract to Struck Construction Co., 147 North Clay Street, for one-story addition for storage and distribution. Cost close to \$50,000 with equipment. Walter C. Wagner, Breslin Building, is architect.

Perry & Derrick Co., 908 Central Avenue, Cincinnati, manufacturer of paints, oils, varnishes, etc., has plans for fourstory addition to plant at Dayton, Ky., for which bids will be asked soon on general contract. Cost over \$70,000 with equipment. E. C. Landberg, 114 Garfield Place, Cincinnati, is architect.

Frankfort Distillery, Inc., Columbia, Building, Louisville, with plant on Dixie Highway, has let general contract to J. F. Russell & Co., Jackson and East Burnett Streets, for 10-story storage and distributing plant, 145 x 170 ft., on Willow Spring Road, Baltimore. Cost over \$200,000 with equipment. Carl J. Epping, 806 East Broadway, Louisville, is architect.

Tennessee Products Corp., 14 Cummistation, Nashville, Tenn., operating plants at Wrigley, Hickman County, and Rockdale, Maury County, Tenn., for production of industrial chemicals and minerals, plans

expansion and improvements, including new equipment. Fund of \$87,000 is being arranged through RFC for project.

■ SOUTHWEST

City Council, City Hall, Kansas City, Kan., asks bids until Dec. 1 for equipment for municipal grain elevator on Missouri River Levee, including electric motors and general operating machinery, grain-cleaning machinery, grain-cleaning machinery, grain drier units, dust-collecting system, bin temperature control system, conveying machinery for conveyer gallery, box car dumper, gasoline locomotive and other equipment. Entire project will cost about \$380,000. Horner & Wyatt, Board of Trade Building, Kansas City, Mo., and Walter F. Schulz, Shrine Building, Memphis, Tenn., are associated consulting engineers.

Memphis, Tenn., are associated consulting engineers.

Ruberoid Co., 9215 Riverview Drive, St. Louis, manufacturer of roofing products, has let general contract to H. B. Deal & Co., 1218 Olive Street, for one-story additions for general production, storage and distribution. Cost over \$60,000 with equipment. Morris F. Marks, Ambassador Building, is engineer. Main offices of company are in New York.

Fidelity Products Co., Brownsville, Tex., manufacturer of cottonseed oil, has acquired large tract on Valley Fair Boulevard, Harlingen, Tex., for new cottonseed oil mill, with power house and other mechanical structures. Cost close to \$75,000 with equipment.

chanical structures. Cost close to \$75,000 with equipment.

United States Engineer Office, Galveston, Tex., asks bids until Dec. 2 for two drag-line excavators (Circular 83).

City Council, Bryan, Tex., plans transmission and distributing lines for rural electrification in parts of Brazos and Burleson Counties, about 250 miles, with service facilities. Service will be secured from local municipal electric power plant. Fund of \$256,000 has been secured through Federal aid.

of \$20,000 mis been seen seen seen aid.

Inco Packing Co., Coffeyville, Kan., has plans for new two-story meat-packing plant at Harlingen, Tex. Cost close to \$50,000 with equipment. E. P. Kinzie is

♦ WESTERN PA. DIST. ▶

Hamburger Distillery, Inc., Oliver Building Pittsburgh, W. D. Baer, treasurer, has let general contract to Engineering Contracting Corp., North and Linden Avenues, Baltimore, for five-story addition to distilling plant at Brownsville, Pa., for storage and distribution. Cost over \$85,000 with couloment.

tilling plant at Brownsville, Pa., for storage and distribution. Cost over \$85,000 with equipment.

Joseph S. Finch & Co., Schenley, Pa., distillers, have let general contract to Frank Messer & Son, 2515 Burnet Avenue, Cincinnati, for six-story addition, 150 x 225 ft., for storage and distribution. Cost over \$250,000 with equipment. Company headquarters are in New York.

Talbot Brothers Coal Co., Chester, W. Va., plans new boiler plant at coalmining properties, to replace unit recently destroyed by fire. Cost close to \$25,000 with equipment.

◆ OHIO AND INDIANA ▶

E. F. Hauserman Co., 6800 Grant Avenue, Cleveland, manufacturer of steel partitions and kindred steel products, has let general contract to H. K. Ferguson Co., Hanna Building, for one-story addition, 86 x 210 ft. Cost over \$75,000 with equipment. George S. Rider Co., Marshall Building. is architect.

ment. George S. Rider Co., Marshall Building, is architect.

Sandusky Foundry & Machine Co., Sandusky, Ohio, manufacturer of paper-making machinery and parts, etc., plans one-story addition. Cost over \$45,000 with equipment. Company is an interest of Paper & Textile Machinery Co., Sandusky. C. W. Poe Co., 2795 East Eighty-third Street, Cleveland, manufacturer of insulating products. has leased three one-story

Street, Cleveland, manufacturer of insulating products, has leased three one-story buildings, about 40,000 sq. ft. floor space, at 2795 East Eighty-third Street, for plant. Company will make improvements and install machinery to cost about \$50,000.

Vess Bottle Beverage Co., 9 Brewer Street, Columbus, Ohio, has let general contract to N. J. Mulligan, 496 Hutton Place, for one and two-story mechanical-bottling plant, \$2 x 83 ft. and 24 x 25 ft., respectively. Cost about \$45,000 with equipment. Frederick Fornoff, 35 East Main Street, is architect. architect.

**Ionsanto Chemical Co., 1700 South Second Street, St. Louis, has let general con-

tract to Carmichael Construction Co., 148
East Miller Avenue, Akron, Ohio, for onestory plant at Akron, with foundations for
second story later. Cost close to \$100,000
with equipment.
Contracting Officer, Material Division,
Army Air Corps, Wright Field, Dayton,
Ohio, asks bids until Dec. 2 for brace hand
pump and strainer support brackets,
bracket hand pump and strainer supports
(Circular 339), 200 ignition manifold assemblies (Circular 332); until Dec. 3, exhaust collector ring assemblies (Circular
345), one air compressor (Circular 346),
propeller blade de-icer slinger rings (Circular
344); until Dec. 4, one pipe-cutting and
threading machine (Circular 347), 500 connector type panel assemblies (Circular
351).

Rowes Seal Fast Corp., 226 North Pine

hreading machine (Ulreum.

threading machine (Ulreum.

hreading machine (Ulreum.

Bowes Seal Fast Corp., 226 North Pine Street, Indianapolis, manufacturer of automobile equipment, has acquired property at 147 North Pine Street, comprising eight one and two-story buildings, with power house, and will remodel for expansion.

Contracting Officer, Quartermaster Corps, Jeffersonville, Ind., asks bids until Nov. 30 for range parts, including doors, hooks, panels, panel rests, door frame steel turnbuckles, damper rods, etc. (Proposal 431.94).

431-94).

American Metal Door Co., Richmond, Ind., recently organized by J. J. McCauley and C. A. Winzer to manufacture fireproof and hollow metal doors, is located at 19th Street and Pennsylvania Railroad.

■ MICHIGAN DISTRICT ▶

Humphrey Heater Co., Kalamazoo, Mich., manufacturer of heaters and parts, has plans for one-story addition and improvements in present plant. Cost close to \$40,000 with equipment.

North American Pulp & Paper Corp., Sheboygan, Mich., has approved plans for modernizing a former sulphite pulp mill for new unit for bleaching pulp and deinking paper. Cost about \$45,000 with machinery.

inking paper. Cost about \$45,000 with machinery.

Detroit Vapor Stove Division, Borg-Warner Corp., 12345 Kercheval Avenue, manufacturer of heating stoves and parts, has plans for one-story addition. Cost close to \$50,000 with equipment. Shreve, Anderson & Walker, Book Building, are architects.

City Council, Dowagiac, Mich., plans extensions and improvements in municipal electric light and power plant, including new equipment. Cost about \$200,000 with equipment. Ayres, Lewis, Norris & May, Ann Arobor, Mich., are consulting engineers.

Federal Engineering Co., 2519 Bellevue Avenue, Detroit, manufacturer of mechani-cal equipment, has let general contract to Austin Co., Curtis Building, Detroit, for one-story addition. Cost about \$50,000

■ MIDDLE WEST ▶

Vulcan Stamping & Mfg. Co., 4036 West Lake Street, Chicago, manufacturer of metal stampings and kindred metal goods, will take bids soon on general contract for one-story addition. Cost close to \$100,000 with equipment.

Cribben & Sexton Co., 680 North Sacramento Boulevard, Chicago, manufacturer of stoves, ranges and parts, has let general contract to William Gade, 1904 North Kedvale Avenue, for two one-story additions, 29 x 81 ft., and 53 x 119 ft., for general production, and storage and distribution, in order noted. A. P. Swanson & Associates, Desplaines, Ill., are architects.

United States Engineer Office, Chicago, asks bids until Dec. 2 for one automatically controlled, oil-lubricated deep-well turbine pumping unit, complete with auxiliary equipment (Circular 30).

Viking Pump Co., Cedar Falls, Iowa, manufacturer of pumping machinery and parts, is considering one-story addition for expansion in production divisions. Cost close to \$100,000 with equipment.

Nebraska Beef Co., South St. Paul, Minn., Max Cohen, head, meat packer, has approved plans for new two-story and basement meat-packing plant, 55 x 105 ft., at Omaha, Neb. Cost over \$50,000 with equipment.

Signal Corps Procurement District, 1819

Grand Grand

rings, 36 ringing machines (Circular 37), 1500 receiver shells and 70 terminal boxes (Circular 42).

Hein-Werner Motor Parts Corp., Waukesha, Wis., manufacturer of automotive parts and equipment, plans one-story extension and purchase of additional equipment. Company is arranging sale of stock to total over \$200,000; considerable part of fund for purpose noted.

A. E. Appleyard, Ashland, Wis., plans investment of \$100,000 in hydroelectric generating plant on Potato River in Iron County, Wis., including factory to convert steel scrap into saws for stone-cutting plant of American Black Granite Co., Ashland, at nearby quarries. Plans await approval of Wisconsin Conservation Commission.

proval of Wisconsin Conservation Commission.

Ford Motor Co., Dearborn, Mich., has announced immediate re-equipment of Milwaukee branch assembling plant, idle since 1932, to resume production of passenger and commercial cars by Jan. 1. Modernization cost about \$400,000. W. E. Simons is manager at Milwaukee.

Marinette, Wis., Board of Vocational Education has accepted hid of Theodore Klaver & Sons, local builders, for construction of new \$114,000 vocational school, 122 x 207 ft., two stories and basement, as PWA project. H. E. Munson is secretary of board.

PWA project. H. E. Munson is secretary of board.
L. J. Kaufman Co., Manitowoc, Wis., general machinist and jobbing manufacturer. has purchased plant of Dueno Mfg. Co., Manitowoc, to increase its output of manufactured articles and also engage in specialty work.

◆ PACIFIC COAST ▶

Paxton Nailing Machine Co., Delhi Road, Santa Ana, Cal. manufacturer of mechani-cal equipment and parts, has plans for two one-story additions, about 8500 sq. ft. floor space. Cost close to \$35,000 with equip-

one-story additions, about course, it. norspace. Cost close to \$35,000 with equipment.

Liquid Carbonic Pacific Corp., Ltd., 593
Mission Road, San Francisco, manufacturer of carbonating machinery and parts, bottling equipment, etc., has plans for new works on Stuart Street, for production of dry ice, carbonic gas and allied specialties. Cost over \$250,000 with machinery. Louis Rosener, 233 Sansome Street, is consulting engineer. Company is subsidiary of Liquid Carbonic Corp., Chicago.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Dec. 1 for following motor-driven machines: Two engine lathes (Schedule 9311), two drilling machines and spare parts (Schedule 9311), two engine lathes (Schedule 9314), seven engine lathes (Schedule 9296): until Dec. 4, one engine lathe (Schedule 9296): until Dec. 4, one engine lathe (Schedule 9294) for Mare Island Navy Yard; until Dec. 1, for two engine lathes (Schedule 9294) for Mare Island and San Diego yards.

Rainier Puln & Paper Co., Shelton.

(Schedule 9294) for Mare Island and San Diego yards.

Rainier Pulp & Paper Co., Shelton, Wash., has let general contract to Austin Co., Seattle, for two one-story additions to sulphite pulp mill, 60 x 150 ft., and 50 x 120 ft. Cost close to \$100,000 with equipment. First noted will be used for increase in pulp production, and latter unit for storage and distribution. Main offices of company are at San Francisco.

Telegraph Refinery, Anaheim-Telegraph Road, Los Angeles, plans rebuilding part of oil refinery recently destroyed by fire, with larger part of loss, estimated at \$100,000 in steel tank storage department.

♦ FOREIGN ▶

Coating Mill Co., Ltd., Cardiff, England, recently organized with capital of \$500,000, care of South Wales and Monmouthshire Trading Estates, Ltd., Cardiff, has acquired about 10 acres at Nantgarw, near Cardiff, for new pulp and paper mill. Plant will include power house, pumping station, machine shop and other mechanical departments, and will be built by last noted organization for Coating company. Cost over \$400,000 with machinery.

County Council, Sydney, Australia, asks bids until Jan. 28 for three 13,500-kva. power transformers with auxiliary equipment for Paddington power substation (Specifications 75).

Celotex Corp., 919 North Michigan Avenue, Chicago, manufacturer of building board products, insulating board and kindred specialties, is selecting a site in England for new mill. Cost over \$300,000 with equipment. B. G. Dahlberg, president, recently sailed for London to complete arrangements for plant.

Developments in Chemistry of Steel Making

(CONCLUDED FROM PAGE 50)

or a few minutes at 200 deg. C suffices to restore the metal to the condition permitting stretcher strains.

Steels known as non-ageing steels are being manufactured by a practice which would primarily be expected to reduce the concentration of dissolved oxygen to a minimum. While such steels are not entirely free from strain ageing and are prone to stretcher strain, except as given some cold work, the rate of change in them from the cold worked state is almost negligible. Hydrogen purified electrolytic iron is, however, almost free from strain hardening while carbon-free high-oxygen iron age hardens very strongly. One seems justified in regarding oxygen almost certainly as responsible at least for strain ageing. The effects of strain ageing may be minimized by working the metal cold and heating to some temperature of rapid precipitation and

So much has been written about the use of X-rays in metallurgy that no apology is needed for making no reference to it beyond saying that it is a subject of very great theoretical and practical importance. It is, however, desirable to refer to waves of another type, which are just beginning to find application and which may prove of great value to the industry in the future. These are ultra sound waves, whose character resembles ordinary sound waves except that they are of higher frequency and in consequence, like light, they can be focused in certain directions and will give shadow zones when obstacles are placed in their path. They can be produced quite simply by magneto-electric methods. The permeability of iron and steel for them is very great. If inequalities, such as cracks, pipes or blowholes are present in the metal, its transmitting power becomes extraordinarily small and its absorptive power for the sound waves very great, making a proofing test of steel readily possible. These ultra sound waves can be used to raise the tensile strength of steel, to accelerate the nitriding process, to hasten the process of solidification of cast metal and accordingly to modify its structure, and to pro-mote the alloying of two metals such as nickel which has been electrically deposited on steel. At 450 deg. C, under high frequency oscillations, the nickel alloys with and is absorbed by the steel. It has also been shown that ultra sound waves can be used to degasify molten metal. They have been applied in the preparation of emulsions of silver salts in gelatin in a finer state of division than would otherwise be possible. Dust particles in flue gases will precipitate and agglomerate together quickly and completely under their influence. The properties and useful possibilities of ultra sound waves are, as yet, imperfectly understood and they have been mentioned as indicative of the latest advances which are taking place in experimental physics and which may prove of great importance to the metallurgist.

Much work of importance has also been done on the ultimate strength of metals. A rough mathematical estimate of the ultimate strength of a single crystal gives values about one thousand times as great as those measured experimentally. A full understanding of the reason for the great difference in the values has not come yet. When it does, as it soon will, it is bound to bring with it new possibilities for the use of metals in the service of mankind.

Buick Shotblasts Large Castings Automatically

(CONCLUDED FROM PAGE 43)

and efficient, the shot itself must be kept clean. Also it must be rehandled over and over again, just like foundry sand. Light dust is carried out of the booth by baffled suction ducts along the back wall opposite the rotor blasts. Heavier molding and core sand, nails and the shot drop through the floor grating to hoppers which discharge to rubber belt conveyors. These in turn bring the material to a central boot of a bucket elevator. At the work discharge end of the machine, bar grate floors with hoppers are also provided so that all abrasive can be dumped and put back in the system. Air-operated bumpers help remove all abrasive from the cylinder jackets. On the way to the belts the mixture passes over refuse screens which take out the Rubber large foreign matter. baffles 1/4 in. thick on either side of the belt keep the dust confined as

the mixture slides off the hopper walls.

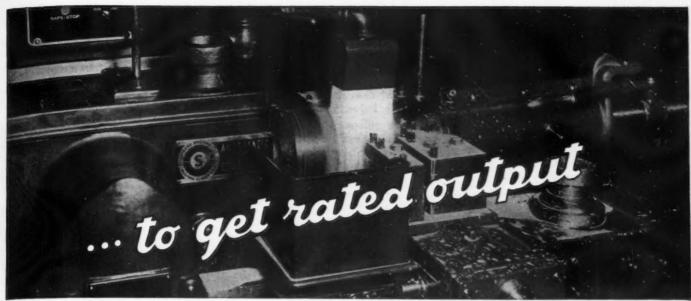
The buckets discharge their load to a central hopper provided with four feed chutes to separators for each blast unit. Here by screen and air separation the last of the dirt is removed. Vent pipes carrying 4800 cu. ft. of air a minute exhaust dust from the separators to the central foundry dust collecting system. From the blast cabinet an additional 7200 c.f.m. of air are exhausted through a cloth screen dust collector, maintaining a negative pressure within the cabinet.

Present capacity of each system is 150-180 blocks an hour, but this output can be increased with ideal conditions and simplified design of work. A variable-speed drive to the work conveyor indexing mechanism makes this possible. Prior preparation of the casting includes some air hammer work to remove obvious projections, as well as snag grinding of fins on top and bottom of the block. Casting must be removed from a roller conveyor by electric hoist and hung on the blast machine conveyor, which is confined to the machine itself. The return strand of the work conveyor passes along outside the entire length of the blast machine and this space can be used for loading and unloading if desired.

Eliminates Silicosis Hazard

No men are in the blast room and hence there is no silicosis hazard either from the cleaning medium nor the molding sand. The entire work environment is cleaner and safer. There is no requirement for compressed air, which is one of the most expensive services in a shop, and the amount of ventilating air is relatively small. Costs per unit of work are small and the castings come out much cleaner than when sand-blasted. In fact, the machine sets up new standards of cleaning room practice. Hence it is evident that everybody has stood to gain by this latest Buick installation.

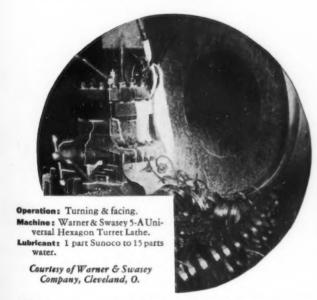
Consolidated Steel Corp., Ltd., Los Angeles, has been awarded contracts for a wheel type regulating gate at \$37,729.83 and a gate frame at \$11,817.85 for the auxiliary spillway at Horse Mesa dam in Arizona, a Bureau of Reclamation project. S. Morgan Smith Co., York, Pa., has been awarded a contract for a gate hoist at \$36,855.06 for the same project.



Courtesy of Sundstrand Machine Tool Co.

FLOOD TOOLS AND WORK with SUNOCO





Although the modern lathe meets all the requirements for high-speed turning, the production of quality work at rated output depends on the performance of turning tools. They must take heavy, clean cuts at high surface speeds with long runs between tool resharpenings—and that calls for an efficient cutting lubricant.

With Sunoco, turning tools retain their cutting edges, chips will not seize, cuts are clean and accurate. To prolong tool life, increase machine hours and get rated output, flood the tools and work with Sunoco.

FREE—A Handbook of Modern Machine Tool Practices

Send for a copy of "Cutting and Grinding Facts". It contains a wealth of information with illustrations on 46 modern machine tool operations.

SUNDCO EMULSIFYING

CUTTING OIL

SUN OIL COMPANY, PHILADELPHIA, U. S. A.

Subsidiary Companies: Sun Oil Company, Ltd., Montreal, Toronto British Sun Oil Company, Ltd., London, England

"Double Damn It" Say They

(CONCLUDED FROM PAGE 38)

the basis of better efficiency and better adaptability to their problem, but the seller of the \$15,000 equipment was a large steel purchaser. He got the order.

That may be an unusual occurrence, but I know it is true and it does illustrate what reciprocity will get us into.

"DAMMIT."

Let's Look at the File

THE writer is very much interested in the article on page 33 of the Sept. 24 issue of THE IRON AGE entitled "Reciprocity Damned."

As manufacturers of control apparatus, we sell to all industries and consequently feel that we can express some kind of an opinion as to whether or not the factor of reciprocity plays a big part in industry as a whole. Our experience has been that in no one of the industries that we contact is the factor of reciprocity more prominent than in the steel manufacturing industry.

A new salesman calling on the purchasing agent for a steel manufacturing plant, trying to sell, for instance, control apparatus, will very likely have the experience of having the purchasing agent draw out a little file containing the names of the control manufacturers that have bought steel from the prospect in question. If the salesman's employer is not listed among those present, there is practically no chance in the world of his receiving any busi-

If, on the other hand, his firm's name is listed, then he can expect that proportion of the steel manufacturer's control business that his company's purchases of steel from the manufacturer in question are to the total amount of steel bought by the control manufacturers buying from that particular company. This rule is so general in the steel industry that it would be the writer's opinion that instead of trying to obtain correction of the reciprocity situation for industry as a whole, a very excellent and broad start could be made to wipe out this evil if the manufacturers of steel saw to it that their purchases were not so generally based in terms of reciprocity.

"SELF CONTROL."

A New Fra in the Pressed Metal Industry

(CONTINUED FROM PAGE 31)

best adapted will relieve a measure of the losses long accepted as a necessary evil in production by purely mechanical methods. It may be said that the pendulum of development that swung so far toward mechanically actuated equipment has returned to a position of balance, to the advantage of all concerned.

In addition to its now secure position in the pressed metal industry the hydraulic press reaches into a number of other industries. Beside drawing, forming, forging and the extrusion of metals, it is used in the rapidly growing hot molding field, practically all plastics being produced by hydraulic pressure because of its follow-up ability. Cold molding of such items as veneer and plywood, the manufacture of belts in both the power transmission and abrasive types, briquetting of feeds, fuel, dry ice, carbon, soap, etc. Baling, including sheet metal scrap, and rebaling for shipping of cotton, etc. Extraction. Straightening and bending, stretching, testing (up to 4 million lb.). Rubber curing with hot plates for belts, etc. Riveting for small work at high speeds.

Such is the present range of activity for the modern version of the hydraulic press. It is a broad one and one of vital importance in a production system that has carried our civilization far since the primitive start by Orziel Wilkinson in 1779. It is significant in that it means the adaptation of an industry to new conditions and the production of a new tool to carry out the demands made by those conditions.



d wear-resistance of Manganese Steel, wheel unsurpassed in long life and

Specify AMSCO Manganese Steel Dou-ble Wall Crane Wheels for your new cranes, and for replacements on your present equipment. They are made in all sizes, for all cranes. Send your inquiry to the manufacturer of your crane or to us.

AMERICAN MANGANESE STEEL COMPANY

Division of American Brake Shoe & Foundry Con 375 EAST 14th STREET, CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; Oakland, Calif.; Los Angeles, Calif. • Offices in Principal Cities

fracture.

Because the wheel is uniformly tough and strong throughout.

Because the quickly acquired tread hardness is constantly self-renewing and is more durable than any "surface-hardened" steel.

durable than any "surface-hardened" steel.

Because the new double wall design eliminates the possibility of web breakage at flange or hub; insures perfect heattreatment in manufacture; and gives in combination with the toughness, strength